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BY

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TWELFTH EDITION

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PREFACE

TO

THE TWELFTH EDITION

In this edition the Veterinary Section has been amplified to make the work more useful to those situated some distance from expert advice.

Formulas generally have been revised, many sections being considerably extended. Recipes have been added for the manufacture of home-made Wines, Cocktails, Ice Creams, Water Ices, Confectionery and sundry other domestic articles.

The Photographic Formulas have been brought up to date, and the Pharmaceutical and Toilet Sections revised in accordance with modern practice.

Since the last edition special laws have been framed dealing with Dangerous Drugs (Dangerous Drugs Acts, 1920 and 1923). Recipes affected by the new legislation bear the letters *D.D.A.* by the side of the formula.

E. W. L.
H. B. S.

London, S.E. 1.

PART I

VETERINARY MATERIA MEDICA AND PRESCRIPTIONS

INTRODUCTION

Temperature.—The temperature of an animal is important in diagnosing illness. It must, however, be remembered that after rapid exercise the temperature may be above the normal, but after the animal has rested for a short time, under ordinary circumstances, it becomes normal.

The thermometer is usually inserted into the rectum, or in the case of a female into the vagina.

The temperature varies slightly even in health, the following being normal: horse 100·2°, ox 102°, pig 102°, sheep 103°, dog 101·5° F. Milking cows may range to 103° in health.

An increase of one or two degrees may only indicate a slight derangement, but any higher temperature, in conjunction with other symptoms, may indicate serious disease.

Pulse.—The pulse of a horse is best taken at the angle of the lower jaw, where the artery is easily compressed and the beats interpreted. In a heavy horse the pulse should beat about 30 times a minute, but in highly-bred stock it may rise nearly to 40. Exercise naturally increases the rate of the pulse. In health it should be full and round. If hurried, fever is probably indicated, and is confirmed by the thermometer. A very slow pulse may point to staggers or extreme debility.

The pulse of an ox is felt at the artery under the forearm, at the back of the fetlock, or at the bare portion under the tail.

In dogs and cats it is most convenient to compress the femoral artery inside the thigh, but as they are so readily excited too much reliance should not be placed on a pulse count.

Normal pulse.—Horse 35–45, ox 45–60, pig 55–80, sheep 70–80, dog 70–95, cat 110–130 per minute. Young animals like foals, calves, lambs, are slightly faster.

Respiration.—This must be determined when the animal has been at rest for some time. Horse should be 8–12, ox 12–16, pig 20–30, sheep 20–30, dog 15–25.

Temperature, pulse and respiration all need to be taken into account in determining the state of an animal. In a work of this description it would be out of place to enter into questions of diagnosis, but if all three are abnormal, the animal, as a measure of precaution, should certainly be isolated.

Anæsthetics.—For horses and cattle pure chloroform is used as a general anæsthetic, but for dogs, a mixture of three parts of chloroform and one part of ether is preferred.

For local operations, cocaine and cocaine solutions are used.

Poisoning of Dogs and Cats.—Nowadays it is not usual to use prussic acid. Death by chloroform is more merciful. The lethal chamber should be a well-made box with a closely-fitting lid. A partition, perforated with a few holes, should be made a couple of inches from one end. The animal to be destroyed is placed in the chamber,—in the case of a cat insert the hindquarters first,—and the lid secured. Half an ounce of chloroform on a large pad of cotton wool is pushed through a hole in the end next the partition, and the opening closed with a bung.

The chloroform vapour slowly permeates the entire box, and the animal is anæsthetised without struggling. When anæsthesia is complete the animal may be killed by squirting prussic acid into its mouth, or it may be left in the closed chamber until death supervenes.

VETERINARY MATERIA MEDICA

NOTE.—The dose for a sheep is rather less than that for a hog. The dose for a cat is about half that for a small dog. Cattle, as a rule, stand larger doses than horses.

The Preparations enumerated, unless otherwise described, are those of the British Pharmacopœia.

Acid, Arsenious. *See* ARSENIC.

Acid, Benzoic.—Antiseptic, stimulant, expectorant, and diuretic. Useful in inflammation of the bladder.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	10–20 grains	3–10 grains

Acid, Boric.—A mild antiseptic and astringent. A saturated solution (about 4 per cent.) is a valuable lotion for bathing sores of all kinds. The powder mixed with an equal weight of talc or starch is useful for dusting on chafed surfaces.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	¼–¾ oz.	10–30 grains	5–15 grains

Acid, Carbolic.—*Internally* in excessive doses it is poisonous. Small doses are useful in diarrhœa. *Externally* lotions of 2 to 3 per cent. may be used for all kinds of sores. When undiluted it may be employed as a caustic in canker of the foot of the horse, and for foot-rot in sheep.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	15–30 grains	2–3 grains	1–2 grains

Acid, Hydrochloric, Dilute.—Tonic, and a useful hepatic stimulant. (*See also* MURIATIC ACID.)

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–4 fl. dr.	10–30 minims	2–8 minims

Acid, Hydrocyanic, Dilute (*Dilute Prussic Acid*).—*Scheele's acid is double this strength.* Useful to allay vomiting, cough, &c. Added to lotions acts as a sedative. (*See* PITYRIASIS.) Prussic Acid is exceedingly poisonous.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	20–30 minims	5–10 minims	1–4 minims

Acid, Salicylic.—*Internally* is rarely given, as it is somewhat irritating. (*See* SODIUM SALICYLATE.) *Externally*, in the form of ointment, it is employed in various skin affections—eczema, pruritus, ringworm, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	8–20 grains	2–8 grains

Acid, Sulphuric, Dilute.—*Dose, etc.*, as Dilute Hydrochloric Acid.

Acid, Tannic (*Tannin*).—A powerful local astringent. May be employed to stop bleeding of any kind, both internally and externally. Given in diarrhœa.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 drachm	5–15 grains	2–5 grains

Aconite, Tincture, B.P.—Useful in feverish attacks and cases of local inflammation, in pneumonia, pleurisy, and some stages of bronchitis. Very small doses frequently repeated are more useful than one large dose. *It is poisonous in excessive doses.*

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	20–60 minims	4–15 minims	2–5 minims

NOTE.—Fleming's Tincture is much stronger than the above.

Aloes, Barbadoes.—An aloetic purging ball, takes from eighteen to thirty-six hours to act, accordingly as the horse has been well prepared or not. Aloes is not to be depended on for cattle or sheep. Pigs, as a rule, can only bear small doses—1 to 2 drachms ; dogs, 10 to 40 grains. The administration of Aloes should be avoided in cases of irritation or inflammation of any part of the alimentary canal ; also in piles, bronchitis, or inflammation of any organ. It should not be used as a purgative for any pregnant animal. (For Aloetic Ball, *see* CONSTIPATION.)

Dose as Purgative.—For horses, ¼ –1 oz ; sheep and pig, 1–2 drachms.

Alum.—Astringent and hæmostatic.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	¼–1 oz.	20–60 grains	5–20 grains

Ammonium Benzoate.—As Benzoic Acid.

Ammonium Bromide.—*Dose* and uses same as Potassium Bromide (*q.v.*).

Ammonium Carbonate.—Gastric and cardiac stimulant. Useful stimulating expectorant in bronchitis, pneumonia, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	15–30 grains	3–10 grains

Solution of Ammonia (*Ammonia Water*). *Dose.*—May be given in place of Spirit of Sal Volatile in the same doses.

Spirit of Sal Volatile (*Aromatic Spirit of Ammonia*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1½ fl. oz.	½–1 fl. dr.	10–20 minims

Ammonium Chloride.—A mild cholagogue, diaphoretic, diuretic, and general gastric stimulant. It stimulates the mucous membrane of the pharynx, larynx, lungs, &c.

Dose.—For horses and cattle, ¼ to 1 oz., sheep and swine, ½ to 2 drachms.

Aniseed Powder.—Cordial, stomachic, and tonic.

Dose.—For horses and cattle, ½ to 1 oz.; sheep and pigs, 1 to 4 drachms.

Aniseed Oil.—Added to purgatives to prevent griping. *Dose.*—For horses and cattle, 20 to 60 drops; sheep and pigs, 3 to 10 drops.

Antimony, Black (*Black Sulphide of Antimony*).—Alterative and diaphoretic. Generally added to condition powders to improve the coat. It frequently deranges the stomach, and its promiscuous use is much to be deprecated.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–3 drachms	5–20 grains	2–8 grains

Antimony, Tartarated (*Tartar Emetic*).—Emetic and diaphoretic. It is a powerful depressant. Useful in the *early* acute stage of bronchitis and pneumonia, but dangerous afterwards. Its administration has been largely abandoned in favour of ipecacuanha. The larger doses are only given as a vermifuge.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 drachm	3–12 grains	1–2 grains

Areca Nut.—Only give as a vermifuge.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	½–2 drachms	¼–2 drachms

Arsenic, White (*Arsenious Acid*).—*Internally* is tonic and alterative, but its operation requires to be carefully

watched. *Externally* it is a component part of many sheep-dip powders, &c. Arsenic is a dangerous poison.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	3–8 grains	$\frac{1}{8}$–$\frac{1}{2}$ grain	$\frac{1}{32}$–$\frac{1}{10}$ grain

Asafetida.—Antispasmodic, stimulant, and laxative. Useful in nervous affections and chronic cough. Does good in flatulent distension of the bowels.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	$\frac{1}{4}$–$\frac{3}{4}$ oz.	$\frac{1}{4}$–1 drachm	5–20 grains

Atropine.—The active principle of Belladonna.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Sulphate	1–2 grains	$\frac{1}{20}$–$\frac{1}{6}$ grain	$\frac{1}{64}$–$\frac{1}{24}$ grain

Balsam of Copaiba.—A diuretic and general stimulant to the mucous membrane. Useful in some diseases of the urinary organs, and as a disinfectant expectorant in bronchitis.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 fl. oz.	1–2 fl. dr.	5–30 minims

Balsam, Friar's (*Compound Tincture of Benzoin*).—Sometimes given in tablespoonful doses to horses, in chronic cough, mixed with yolk of egg, gruel, or Linseed tea. Is an excellent application to wounds.

Barley.—A decoction of Barley is given as an emollient and demulcent. It is a grateful drink in inflammatory and feverish diseases.

Bayberries are stomachic and carminative. Doses of one teaspoonful to a tablespoonful of the powder are added to condition powders by some grooms. Bayberries are an ingredient of the mixture known as ' Diapente.'

Bearberry.—The leaves are diuretic and, like buchu, act as an astringent disinfectant on the urinary tract. Half a pint of the infusion may be given in pyelitis, cystitis, irritable bladder, &c.

Belladonna (*Deadly Nightshade*).—*Internally* is diuretic and antispasmodic. Given in cardiac palpitation, constipation, cystitis ; it checks secretion of milk ; relieves cramps, spasm of bladder, rectum, &c. *Externally* it is of the greatest service in relieving neuralgic pain. Belladonna is very poisonous.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the B.P. Tincture	$\frac{1}{2}$–1 fl. oz.	20–60 minims	5–15 minims
Dose of the B.P Extract	$\frac{1}{2}$–1 drachm	5–10 grains	$\frac{1}{2}$–5 grains

Benzoin.—*See* BALSAM, FRIAR'S.

Bismuth.—The carbonate, salicylate, and subnitrate are given in cases of dyspepsia and diarrhœa.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–4 drachms	20–60 grains	3–15 grains

Blisters.—For horses.

Biniodide of Mercury Blister

Mercuric Iodide . . .	1 oz.
Lard	8 ,,

Cantharides Blister

Powdered Cantharides .	1 oz.
Yellow Wax . . .	1 ,,
Lard	4 ,,

Blue Vitriol.—*See* COPPER SULPHATE.

Bole, Armenian.—A ferruginous earth. It is an ingredient of many old recipes, but is not recognised by modern veterinarians, being replaced by the more exact iron salts.

Borax.—A mild antiseptic. Mixed with four or five parts of honey or treacle is used in cases of sore mouth, &c. A lotion of 20 grains to the pint is a soothing eye wash for simple cases.

Bran.—Mucilaginous and slightly laxative; given in mashes.

Brimstone.—*See* SULPHUR.

Buchu.—A diuretic and astringent to the urinary tract. Useful in catarrh of the bladder, irritable bladder, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of Infusion	2–4 fl. oz.	¼–1 fl. oz.	½–2 fl. dr.

Calamine.—Coloured oxide of zinc. *See* ZINC OXIDE.

Calomel (*Mercurous Chloride*).—*See* MERCURY.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose as a purgative.	¼–1 drachm	1–4 grains	1–3 grains

Calumba.—A bitter stomachic and mild non-astringent tonic. Useful in debility of convalescence.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powdered Root	1–4 drachms	15–60 grains	5–15 grains
Dose of the B.P. Tincture	1–2 fl. oz.	1–2 fl. dr.	½–1 fl. dr.

Camphor.—*Externally* is antiseptic, and is useful in liniments as a rubefacient. *Internally* it is sedative, antispasmodic, and warming. In large doses it is poisonous.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	5–20 grains	2–8 grains

Canella.—The powdered bark acts as a warm tonic. It may be added to horse and cattle powders in doses of a teaspoonful to a tablespoonful.

Cantharides (*Spanish Fly*).—Very small doses stimulate the genito-urinary tract. Cantharides must not be used if there is inflammation of any kind. It is quite useless as a general stimulant. *Externally* weak preparations are used as a stimulant. Strong preparations blister. The blisters do not permanently blemish, provided a pure Cantharides blister is used. *See* Blisters.

Dose of the Powder, 3–5 grains for horses and cattle.

Capsicum (*Cayenne Pepper*).—From 20 to 40 grains may be given to horses and cattle (properly diluted) in cases of flatulent colic.

Caraway.—Stimulating and carminative. Useful addition to purgatives to prevent griping, especially when combined with Ginger.

Dose of the Powdered Seeds.—For horses and cattle, 1 to 2 tablespoonfuls.

Dose of the Essential Oil.—For horses and cattle, 10 to 30 drops.

Carbolic Acid.—*See* Acid, Carbolic.

Cardamom Seeds.—Uses and properties as Caraway.

Dose.—A teaspoonful to a tablespoonful for horses and cattle.

Cascarilla.—A mild aromatic tonic and expectorant. Useful in old coughs.

Dose of the Powder.—Half to one teaspoonful for horses and cattle.

Castor Oil.—Laxative. It is uncertain in its action on animals. Horses and cattle will take about half a pint ; calves, 2 to 4 fl. oz. ; sheep and swine, 1 to 2 fl. oz. ; dogs, a teaspoonful to a tablespoonful according to size.

Catechu.—A powerful astringent given in diarrhœa. It is usually combined with Chalk and Opium. Mixed with Honey to form an electuary, is useful in relaxed sore throat.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 drachms	¼–½ drachm	5–15 grains

Chalk, Prepared.—Antacid and astringent. Combined with Tannic Acid or Catechu is given in diarrhœa.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–1½ oz.	1–2 drachms	10–20 grains

Chamomile Flowers.—Aromatic and tonic.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	1–4 drachms	½–1 drachm	5–15 grains

Charcoal.—The powder is used as an antiseptic application to foul ulcers, either sprinkled on or added to poultices.

Charges are compounds of an adhesive nature, corresponding to the plasters of everyday use.

Youatt's formula is a very good one :

Burgundy Pitch . . .	5 oz.
Tar	6 ,,
Yellow Wax . . .	1 ,,

After application cover with cotton wool or finely chopped tow.

Chinosol.—A powerful antiseptic and germicide. Injected into the teats it is a specific for milk-fever (*q.v*). Solutions 1 in 2,000 may be used for cleansing sores and wounds of all kinds, for irrigating the womb in parturient fever, &c.

Chloral Hydrate.—A powerful hypnotic, antispasmodic, and general depressant. Poisonous in excessive doses.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	¼–1 oz.	15–16 grains.	3–10 grains

Chlorinated Lime (*So-called Chloride of Lime*).—Antiseptic and disinfectant. A liquid made by macerating 1 oz. in a pint of soft water forms a powerful detergent wash for foul ulcers.

Chlorodyne.—Of service in colic, diarrhœa, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–3 drachms	10–30 minims	5–15 minims

Chloroform.—*Internally* Chloroform acts as a sedative and carminative. When inhaled under suitable conditions it produces general anæsthesia.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 fl. dr.	7–20 minims	3–8 minims

Cinchona (*Peruvian Bark*).—Stomachic, antipyretic, and tonic. Instead of the bark the tincture may be given in doses of 1 to 2 fl. oz. for horses and cattle ; 1 to 2 fl. dr. for sheep and swine ; ¼ to 1 fl. dr. for cats and dogs. The active principle of the bark is Quinine (*q.v.*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	¼–1 oz.	½–2 drachms	10–40 grains

Cinnamon.—Stomachic and carminative. Given in dyspepsia, diarrhœa, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	2–4 drachms	15–60 grains	5–15 grains

Cloves.—Aromatic, carminative, stimulant. The oil is a powerful antiseptic. Useful addition to purgatives to prevent griping.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	2–4 drachms	¼–1 drachm	5–15 grains
Dose of the Volatile Oil	15–16 minims	3–10 minims	1–3 minims

Cod Liver Oil is a valuable fatty food. As a rule, comparatively small doses do the most good. Useful in tubercular diseases, chronic bronchitis, eczema, &c., and in all cases of defective nutrition.

Colocynth (*Bitter Apple*) is uncertain in its effects on horses and cattle, and is unsuitable for the smaller animals.

Copper Sulphate (*Blue Vitriol*).—Said to act as a tonic (there are many more reliable), but it is rarely given internally. Doses of 10 to 30 grains act as an emetic on sheep and swine. *Externally* it acts as a mild caustic, and a 5 per cent. solution is used as an antiseptic wash for foul ulcers.

Coriander.—A mild aromatic stimulant. Doses of 1 to 4 tablespoonfuls may be added to the food of horses and cattle.

Corrosive Sublimate (*Mercuric Chloride*).—*See* MERCURY.

Cowhage is reputed to be a vermifuge, but it is, to say the least, very unreliable.

Creosote.—A powerful antiseptic and disinfectant. Useful in diarrhœa. *Externally* a few drops dissolved in water form an antiseptic lotion for sores.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose	14–60 minims	2–8 minims	1–4 minims

Croton Oil.—*Externally* Croton Oil is irritant and vesicant, but is not often employed. *Internally* it is a powerful hydragogue cathartic, quite small doses causing great irritation. The dose for strong horses and cattle should never exceed 20 drops. Thirty drops have proved fatal.

Cumin Seed.—The powder is a warm tonic—a great appetiser for horses and cattle. From a teaspoonful (1 drachm) to a tablespoonful (½ oz.) may be added to each meal.

Diapente.—A compound cordial powder, containing Bayberries, &c. Much of that sold by dealers is worthless.

Digitalis.—A cardiac stimulant, increasing the force but not the frequency of the heart's action. The pulse is correspondingly retarded. A useful diuretic, but it should be remembered that it is not excreted rapidly, and is therefore cumulative and poisonous. It is indicated in cases of irritable heart and palpitation, *but not when it is undesirable to increase arterial tension as in fatty degeneration of heart, apoplexy, &c.*

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powdered Leaves	15–60 grains	2–10 grains	1–2 grains
Dose of the B.P. Tincture	1–4 fl. dr.	10–30 minims	5–15 minims

Dover's Powder (*Compound of Opium and Ipecacuanha*).—Given as a sudorific and diuretic to horses and cattle. *Dose* from 1 to 2 drachms.

Epsom Salt.—A cooling laxative. It is not to be depended upon as a purgative for the horse, but in doses of 4 to 5 oz. in a large quantity of water or in a Bran mash it acts as a mild laxative. Some carminative, as Caraway or Ginger, should always be combined with it.

Cattle require from 1 to 1¼ lb., combined with Ginger or some warm seeds, as Caraway or Clove; calves, from 1 to 2 oz., according to age and strength; sheep, ½ to 1 oz.; dogs, 1 to 3 drachms.

Ergot.—Given in small doses *during labour*, when parturition is simply retarded by insufficient uterine action, but not if there is any impediment to delivery. *After*

labour it is administered to prevent hæmorrhage. Ergot is also given as a general hæmostatic in hæmorrhage of the lungs, kidneys, &c.

	Mare or Cow	Sheep or Sow	Bitch
Dose .	¼–½ oz.	15–30 grains	2–8 grains
Dose of B.P. Liq. Ext.	1–4 fl. dr.	10–20 minims	2–8 minims

Ether.—A highly inflammable liquid. *Internally* it is a powerful diffusible stimulant, antispasmodic, and carminative. Exceedingly useful in colic. Injected subcutaneously acts promptly in syncope. When inhaled under suitable conditions it produces general anæsthesia.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 fl. oz.	½–3 fl. dr.	15–90 minims

Fennel.—Ground Fennel Seeds are aromatic, stomachic, and carminative. Horses, cattle, and sheep, may have half a tablespoonful or more added to each feed. Less valuable than Caraway in gripes.

Fœnugreek.—The ground seeds are appetising and stomachic. A dose of one or two tablespoonfuls may be added to each meal.

Formaldehyde (*Formalin*).—An aqueous solution containing 40 per cent. of formic aldehyde. It is a powerful germicide and disinfectant. Strong solutions emit vapour irritating to the eyes and nose. Lotions may contain about a teaspoonful to a pint of water.

Foxglove.—*See* DIGITALIS.

Galbanum.—Stimulant, expectorant, and antispasmodic. Given in the same way as Asafetida (*q.v.*).

Galls.—An astringent ; given in diarrhoea.

	Horses and Cattle	Calves	Sheep and Pigs	Dogs
Dose of the Powder	2–4 dr.	1 dr.	½–1½ dr.	4–10 gr.

Gamboge.—A drastic purgative ; it always causes griping and its action is very uncertain ; 3 drachms given to a horse has been known to cause death.

Gentian.—A pleasant bitter and gastric stimulant ; it excites appetite and operates generally as a tonic. Always safe to give in debility after illness.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	15–60 grains	5–20 grains
Dose of the Compound Tincture	1–2 fl. oz.	1–2 fl. dr.	½–1 fl. dr.

Ginger.—A general stimulant, carminative, and stomachic, and should practically always be added to purgative medicines to prevent griping. Useful in flatulent colic.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	15–60 grains	5–15 grains
Dose of the Tincture	½–1 fl. oz.	½–1 fl. dr.	5–20 minims

Glass, Powdered.—An ancient remedy for expelling worms, now very properly fallen into disuse.

Glauber's Salt (*Sodium Sulphate*).—*Dose*, as a purgative for cattle, 12–20 oz., with Caraway and Ginger. It is of little use for horses.

Glycerin.—*Externally* when diluted with water, Glycerin is emollient in skin affections accompanied by dryness, cracked heels, &c. Especially useful as a softening agent in 'Mudfever' (*q.v.*). Diluted with Goulard's Water is serviceable in allaying many forms of irritation.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 fl. oz.	2–4 fl. dr.	1–2 fl. dr.

Goulard's Extract of Lead (*Strong Solution of Lead Subacetate*).—This is too concentrated for use alone, but when diluted with distilled or rain water (2 fl. dr. to a pint) it constitutes Goulard's Water, a favourite sedative and astringent lotion. The latter is useful in allaying irritable skin affections, and, diluted still further, may be used as an eye wash.

Grains of Paradise.—A warm stimulant frequently employed in cattle medicines. *Dose*, ½ to ¾ oz.

Grey Powder.—*See* MERCURY.

Gum Arabic.—Emollient and demulcent. Given in solution in doses of 1 to 4 oz. to horses and cattle in inflammatory conditions of the bowels, urinary tract, &c.; smaller animals, ¼ to 1 oz.

Hartshorn, Spirit of.—A synonym for ordinary Solution of Ammonia (*q.v.*).

Hellebore, Black. **Hellebore, White.** } These drugs are not recognised by modern veterinarians.

Henbane (*Hyoscyamus*).—The powdered leaves are given in doses of 20 to 60 grains to horses and cattle. Henbane resembles Belladonna (*q.v.*) physiologically, but is

much less active. Chiefly used for its narcotic and sedative properties.

Dose of the Extract	Horses and Cattle	Sheep and Pigs	Dogs
	1–2 drachms	5–20 grains	2–8 grains

Hexamine (*Urotropine*).—This is a valuable diuretic and genito-urinary antiseptic. Given in cystitis and pyelitis.

Honey.—Used in the manufacture of electuaries (confections). Horses generally are fond of it.

Hops.—Tonic and slightly anodyne (?). Fomentations of Hops are sometimes employed in allaying inflammation.

Hydrocyanic Acid.—*See* ACID.

Iodine.—Generally given in the form of Potassium Iodide, as causing less irritation. *Externally*, iodine, in the form of the Tincture, Solution, or Ointment, is used as an irritant or counter-irritant and general lymphatic stimulant in glandular enlargements, &c. If applied too strong or too frequently, vesication and deep inflammation with scarring ensue.

Iodoform.—*Externally* an antiseptic and disinfectant ; of the greatest value in the treatment of almost all kinds of sores and wounds. An excellent dusting powder for wounds is Iodoform 1 part, Powdered Boric Acid 3 parts.

Ipecacuanha.—In full doses is an emetic ; in small doses stomachic and cholagogue, expectorant and diaphoretic. Not much used in veterinary practice.

Dose of the Powder	Horses and Cattle	Sheep and Pigs	Dogs
	30–60 grains	4–10 grains	1–4 grains

Iron.—The preparations of iron are tonic ; in large doses constipating. The persalts, such as the perchloride, are powerful astringents and hæmostatics. Perchloride of Iron Solution, with a little spirit, constitutes Tincture of Steel.

The salts in most general use are :

Iron and Ammonium Citrate.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	10–20 grains	3–8 grains

Iron and Quinine Citrate.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	10–20 grains	3–8 grains

Iron Perchloride Solution.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 fl. dr.	10–30 minims	2–5 minims

Iron Sulphate (*Green Vitriol*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–3 drachms	6–20 grains	3–5 grains

Jalap.—Purgative, but has little effect on the herbivorous animals. Is rather uncertain in its action, but is occasionally given to swine in doses of ½ to 2 drachms; dogs, 10 to 30 grains.

James's Powder.—Practically corresponds to the Pulvis Antimonialis (Antimonial Powder) of the British Pharmacopœia. The dose for horses and cattle is from 20 to 30 grains as an alterative and diaphoretic. Like all antimonial preparations it is depressant and irritant.

Juniper Berries.—Juniper, especially the Volatile Oil, is a powerful renal stimulant and diuretic.

Dose: Horses and cattle, 1 to 2 oz.; sheep and pigs, ¼ to ½ oz.

Dose of the Volatile Oil: Horses and cattle, 1 to 2 fl. dr.; sheep and pigs, 10 to 20 drops.

Kamala.—Given as an anthelmintic for tapeworm. The dose for a horse is 1 to 2 oz.; for a dog, 1 to 2 drachms. It should be followed next day by a purgative. Unreliable, but worth trying.

Kaolin Poultices have quite superseded the ordinary Bran or Linseed poultices for the treatment of discharging wounds and sores of every kind. Bran, Linseed, &c., when made into a poultice with hot water, afford an excellent breeding ground for bacteria, and frequently do a great deal of harm. The Kaolin poultice is easily prepared, is quite free from micro-organisms, and it may be made as antiseptic as can be desired. The mixture can be procured ready for use under the name Kaoplasm.

Lard.—Half a pound of Lard acts as a laxative and emollient to cattle and horses. It is a common basis for ointments.

Laudanum.—*See* Opium.

Lead Acetate (*Sugar of Lead*).—*Dose as an astringent in diarrhœa, intestinal hæmorrhage, &c.*, for horses and cattle, 30 to 40 grains combined with opium. *Externally* in solution, 20 grains to a pint, it forms an astringent eye lotion. Five per cent. lotions applied to abraded surfaces are sedative and healing. (*See also* GOULARD'S EXTRACT.)

Lime, Chloride of. *See* CHLORINATED LIME.

Lime Water.—Mixed with an equal quantity of Olive or Linseed Oil forms ' Carron Oil,' a soothing application in burns, scalds, &c.

Linseed.—A decoction of the seeds (Linseed Tea), 1 or 2 oz. to a pint of boiling water, forms a demulcent drink, very comforting in sore throat, &c. When made thinly it may be freely allowed as a soothing drink in all cases of internal inflammation. Linseed Meal is used for poultices. Linseed Oil is laxative. *Dose* for a horse, 1 to 1½ pint ; cattle, 1 to 2 pints ; sheep, 2 to 4 fl. oz.

Liquorice.—A demulcent, but really of little service except for its flavour.

Liver of Sulphur.—*See* SULPHURATED POTASH.

Lysol.—A dark-coloured alkaline liquid containing cresols and compounds similar to Carbolic Acid. It mixes with water in all proportions, and in ½ to 1 per cent. lotions is used for irrigating after labour, and for most sores, &c.

Magnesia.—*Calcined* Magnesia is antacid and slightly laxative. Horses and cattle may be given ½ to 2 oz. with Ginger and Caraway in flatulent distension. The Carbonate is worse than useless in such cases.

Magnesium Sulphate.—*See* EPSOM SALT.

Male Fern.—*Dose of the Liquid Extract as an Anthelmintic*—Horses, ½ to 1½ fl. oz. ; dogs, 10 to 30 drops. Best given well whipped up in milk. It should be followed by a dose of Linseed Oil as a laxative.

Malt.—Nutritive. Given mixed with Bran mashes.

Mercury.—Metallic mercury is a mildly irritant purgative, acting indirectly as a cholagogue. In large or too frequent doses it salivates. All preparations should be combined with carminatives, as Clove, Caraway, Pepper, &c.

The **Red Iodide** (*Mercuric Iodide*) is a powerful antiseptic and irritant poison. *Solutions* of 1 in 3,500 (20

grains to 1 gallon) may be used for cleansing the hands before operations; *solutions* 1 in 7,000 for washing infected wounds; not stronger than 1 in 10,000 for irrigating mucous surfaces.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 grains	$\frac{1}{8}$–$\frac{1}{2}$ grain	$\frac{1}{32}$–$\frac{1}{8}$ grain

Corrosive Sublimate (*Mercuric Chloride*; *Mercury Perchloride*) is rarely given internally. It is a virulent poison; horses and cattle cannot tolerate more than 4 grains. *Externally* it is a powerful antiseptic, solutions being used of the same strength as those specified under 'Red Iodide' (*vide supra*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 grains	$\frac{1}{8}$–$\frac{1}{2}$ grain	$\frac{1}{32}$–$\frac{1}{8}$ grain

Calomel (*Mercurous Chloride*).—Neither calomel nor any other mercurial salt appears to suit herbivorous animals. Poultry cannot stand more than 1 grain in divided doses during twenty-four hours. On dogs it frequently acts as an emetic. Combined with anthelmintics it sometimes helps in expelling worms. Finely powdered calomel, either alone or mixed with talc, is an excellent stimulating dusting-powder for ulcerated sores.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose (*as a purgative*)	$\frac{1}{2}$–1 drachm	1–4 grains	1–3 grains

Grey Powder (*Mercury and Chalk*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	—	—	3–8 grains

Mercurial Ointment.—The pharmacopœial ointment is too strong for general use. The *Dilute Ointment* (*Troopers' Ointment*) is applied to enlarged joints, for mange, scab in sheep, &c.

Ammoniated Mercury Ointment (*White Precipitate Ointment*).—Useful for destroying lice.

Yellow Oxide of Mercury Ointment is an excellent stimulating remedy for inflamed eyelids.

Red Oxide of Mercury Ointment (*Red Precipitate*) is used as a stimulant to indolent ulcers, enlarged joints and glands, obstinate acne, &c.

Mercurial Lotion (*Yellow or Black Wash*) is applied to unhealthy sores and indolent ulcers.

Acid Solution of Mercuric Nitrate is employed externally as a caustic.

Mindererus Spirit (*Solution of Ammonium Acetate*).—A reliable diaphoretic and diuretic. Given in all kinds of feverish conditions. Useful in kidney disease.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–10 fl. oz.	1–2 fl. oz.	2–4 fl. dr.

Mint (**Spearmint**) and **Peppermint.**—A pint or so of strong infusion of either plant, or the aromatic water, is cordial and carminative. Useful in flatulent colic as a vehicle for stronger remedies. *The dose of essential oil* of either mint is 20 to 60 drops for horses and cattle ; sheep and swine, 5 to 10 drops. Added to purgative medicines prevents griping.

Morphine Acetate.
Morphine Hydrochloride. } Morphine is the chief therapeutic principle of Opium (*q.v.*).

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	4–10 grains	½–1½ grain	⅛–¼ grain

Muriate of Ammonia.—*See* AMMONIUM CHLORIDE.

Muriatic Acid (*Strong Hydrochloric Acid*). Has been used externally as a caustic.

Mustard.—Stimulant, but rarely used as an internal remedy. Made into a cream with tepid (not boiling) water, and applied over the seat of *internal* inflammation or local pain, it forms one of the best counter-irritants. Where Mustard alone proves too powerful, it may be mixed with Linseed Meal, and made into a poultice.

Myrrh.—Stimulant, stomachic, and carminative. Useful addition to aloetic balls. The tincture diluted with water is an innocent remedy for sore mouth, &c.
Dose for horses and cattle, 1 to 2 drachms.

Naphthalene has been given to horses and cattle as an intestinal disinfectant in some cases of diarrhœa. *Dose*, 30 to 60 grains. *Externally*, a 10 per cent. ointment destroys lice.

Naphthol β.—Uses and dose as Naphthalene. Both have been tried with success as a vermifuge.

Nitrate of Silver.—*See* SILVER NITRATE.

Nitre.—*See* POTASSIUM NITRATE.

Nitric Acid (*Aqua Fortis*).—Used externally as a strong caustic.

Nut-Gall.—*See* GALLS.

Nutmeg.—Stimulant and carminative; ½ to ¾ oz. of grated Nutmeg may be given to cattle in flatulent colic.

Nux Vomica.—The seeds contain variable quantities of Strychnine, and the tincture should alone be employed, the *dose* of which for horses and cattle is ½ to 1 fl. oz.; sheep and swine, 1 to 2 fl. dr.; dogs, 5 to 15 minims.

Nux Vomica is a bitter stomachic and carminative. It increases the appetite, and is a powerful nervine tonic and stimulant. For horses small doses may be added with advantage to aloetic balls. It is useful in dyspepsia, obstinate constipation (increasing peristalis), paralysis, debility, chorea and other spasmodic affections. Nux Vomica is very poisonous.

Oak Bark.—Astringent, but not so reliable as Catechu.

Oil of Spike.—The Oil of Spike sold for veterinary purposes is frequently Oil of Turpentine, coloured, and perfumed with Oil of Lavender.

Oil of Tar.—*See* TAR.

Oils, Essential.—The essential oils of Aniseed, Clove, Caraway, Cinnamon, Cumin, Fennel, Peppermint, &c., are antiseptic, carminative, and stimulant, and of the greatest service in flatulent colic and flatulent dyspepsia. Oil of Thyme (Oil of Origanum), while possessing almost identical properties, is generally employed externally as a stimulating liniment, but it has no particular advantage over Oil of Turpentine.

Oils, Expressed (Olive Oil, Linseed Oil, Nut Oil, Cotton Seed Oil, &c.).—The expressed oils are bland nutritives, and when administered in full doses laxative. Alone or mixed with starch mucilage, they are employed as a non-irritating enema. The *dose* for horses and cattle is from ¼ to 1 pint.

Opium.—Opium is anodyne, soporific, and sudorific; a vascular and nervine stimulant. In an overdose it is a narcotic poison. It is given to relieve pain of almost every kind—in inflammation unaccompanied by dyspnœa; tetanus; pneumonia; asthmatic and bronchitic coughs; acute pleurisy; colic; spasmodic affections; nervous and sympathetic vomiting; diarrhœa, especially in combination with astringents as Catechu, Lead Acetate, &c.; irritable bladder, hæmorrhage. *Opium is contra-indicated* in acute inflammation of the sthenic type occurring in plethoric patients; in cerebral affections with suspected vascular

congestion; in pregnancy; and in heart disease. Young animals are very susceptible to Opium. Opium is of little use applied externally to relieve pain.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	½–2 drachms	4–15 grains	½–2 grains
Dose of the Tincture (Laudanum)	1–2 fl. oz.	½–2 fl. dr.	10–20 minims

Opodeldoc (*Soap Liniment*).—Stimulating.

Orpiment (*Yellow Sulphide of Arsenic*).—Not used by modern veterinarians. Highly poisonous.

Pepper, Black and White.—Cordial, warming stimulant. Useful in flatulent colic. *Dose* for horses and cattle, 2 to 4 drachms.

Pepper, Cayenne.—*See* CAPSICUM.

Peppermint.—*See* MINT.

Peruvian Bark.—*See* CINCHONA.

Phosphorus.—Phosphorus is said to stimulate the growth of bone. It should be administered very cautiously, commencing with small doses. Phosphorus is also regarded as a nerve stimulant. Very poisonous.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose	½–1 grain	$\frac{1}{20}$–$\frac{1}{10}$ grain	$\frac{1}{60}$–$\frac{1}{15}$ grain

Poppy Heads.—Slightly anodyne; a decoction about 2 or 3 oz. to a pint of water is used as a fomentation.

Potassium.

Potassium Acetate. **Potassium Citrate.** The therapeutic effects of these salts are identical. Both are reliable diaphoretics and diuretics, hence act as cooling salines in fever.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose	½–1 oz.	1–2 drachms	10–20 grains

Potassium Bicarbonate.—Antacid.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose	½–1½ oz.	½–1½ drachm	10–20 grains

Potassium Bromide.—Hypnotic and sedative.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose	2–6 drachms	15–60 grains	5–15 grains

Potassium—*continued.*

Potassium Chlorate.—Of little use internally. A solution is useful in stomatitis, &c.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–2 drachms	10–30 grains	5–15 grains

Potassium Iodide.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–4 drachms	5–15 grains	2–8 grains

Potassium Nitrate (*Nitre* ; *Saltpetre*).—In small medicinal doses Nitre is a diuretic and diaphoretic, but is much inferior to the citrate and acetate. In large doses it depresses the heart.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 drachms	½–1 drachm	5–10 grains

Potassium Permanganate.—The disinfecting properties of this salt are well known. A 1 per cent. solution is of value as a disinfectant and deodorant of drains, and a little should always be dissolved in the water used for cleaning the floors of stables, &c.

For the purification of drinking-water for animals, solution of Potassium Permanganate may be added until a *faint permanent red tinge* remains after standing for some minutes ; then, if a few grains of ordinary powdered Alum are added, the water well stirred and allowed to stand, the oxidisable substances will be destroyed and will deposit, and fairly pure water may be drawn off by a tap.

Precipitate, Red.—*See* MERCURY.

Precipitate, White.—*See* MERCURY.

Prussic Acid.—*See* ACID, HYDROCYANIC.

Quassia is a pure tonic. Given in dyspepsia, loss of appetite, and debility of convalescence. The *dose* of the powder is 2 to 4 drachms. A strong infusion of Quassia destroys lice and insects generally.

Quinine Sulphate.—Quinine is the most important of the alkaloids obtained from Cinchona. In small doses it is a tonic and stomachic. In large doses it is antipyretic and antiperiodic. Most useful remedy in distemper of dogs.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	20–90 grains	2–10 grains	1–4 grains

Rectified Spirit.—*See* SPIRIT.

Resin.—Said to be diuretic, one or two tablespoonfuls being frequently given to horses with each meal. *Externally*, in the form of Resin Ointment, it is used to stimulate indolent ulcers and sores.

Rhubarb.—In small doses, Rhubarb is tonic and stomachic ; in large doses, it is slightly laxative.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	1–2 drachms	10–20 grains

Saffron.—Formerly reputed useful for many diseases. Now only utilised for its colouring property.

Sal Ammoniac.—*See* AMMONIUM CHLORIDE.

Salicin.—A bitter tonic and febrifuge. Useful in influenza.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–3 drachms	7–30 grains	3–10 grains

Salt, Epsom.—*See* EPSOM.

Salt, Glauber's.—*See* GLAUBER'S.

Saltpetre.—*See* POTASSIUM NITRATE.

Santonin.—Used to destroy internal parasites—round-worm and thread-worm. It does not affect tapeworm. It should be given on an empty stomach, and be followed in a few hours by a purge.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	15–40 grains	2–10 grains	1–4 grains

Sarsaparilla.—Of no service in veterinary practice.

Savin.—A powerful external irritant and poison.

Scammony, Virgin. } Powerful hydragogue cathartics ;
Scammony Resin. } free watery evacuations are induced. A full dose may expel both round-worm and tape-worm, but gripes badly unless combined with Ginger and Caraway.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–3 drachms	5–20 grains	2–8 grains

Senna.—A mild purgative ; of little use.

Silver Nitrate (*Lunar Caustic*).—Has been given to dogs in chorea in doses of ⅛ to ¼ grain. Used *externally* as a caustic.

Soap.—Antacid ; slightly laxative. *Dose* for horses or cattle, ½ to 2 oz.

Sodium.

Sodium Bicarbonate.—Antacid ; given in dyspepsia, especially when combined with Ginger and Caraway.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	¼–½ oz.	10–30 grains

Sodium Bromide. — Hypnotic and sedative. Is generally preferable to the Potassium salt.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–6 drachms	15–60 grains	5–20 grains

Sodium Salicylate.—Useful antiseptic to the urinary tract, but must *not* be given in cases of renal inflammation. Combined with Quinine, useful in influenza or feverish condition.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	2–4 drachms	15–30 grains	5–20 grains

Sodium Sulphate.—*See* GLAUBER'S SALT.

Sodium Sulphite. } Antiseptic, deodorant, and
Sodium Hyposulphite. } disinfectant. Useful in cases of gastric disturbance caused by fermenting food. May be tried in most cases of dyspepsia ; 10 per cent. lotions are employed in some skin diseases.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–1 oz.	½–2 drachms	10–40 grains

Spirit, Rectified.—Should be diluted with water.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	¾–1½ fl. oz.	1–1½ fl. dr.	½–1 fl. dr.

Brandy, Rum, Whisky, &c., may also be given, diluted, in doses of a wineglassful to half a tumblerful, according to the size of the animal. All spirits are stimulant and antispasmodic, and may be given in colic.

Squill.—Resembles digitalis in its action on the heart ; a powerful diuretic and gastro-intestinal irritant. In large doses it is purgative and emetic. It is an excellent stimulating expectorant in bronchitis and emphysema when secretion is scanty.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	½–1½ drachm	4–10 grains	2–4 grains

Stavesacre.—Poisonous. The ointment is used to destroy external parasites. Oil of Stavesacre diluted seven or eight times with Olive Oil may be used for the same purpose.

Steel Drops, Salt of Steel, Tincture of Steel.—*See* IRON.

Strychnine.—A bitter stomachic, carminative, and tonic. *See* NUX VOMICA. The dose should at first be small and be very cautiously increased. Very poisonous.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	½–2 grains	$\frac{1}{15}$–½ grain	$\frac{1}{100}$–$\frac{1}{80}$ grain
Dose of Solution of Strychnine Hydrochlor.	2–6 fl. dr.	½–2 fl. dr.	3–10 minims

Sublimate, Corrosive.—*See* MERCURY.

Sugar of Lead.—*See* LEAD ACETATE.

Sulphate of Copper.—*See* COPPER SULPHATE.

Sulphate of Iron.—*See* IRON.

Sulphate of Magnesia. *See* EPSOM SALT.

Sulphate of Quinine.—*See* QUININE.

Sulphate of Soda.—*See* GLAUBER'S SALT.

Sulphate of Zinc.—*See* ZINC.

Sulphur (*Brimstone*).—There are four common varieties —Sublimed or Flowers of Sulphur, Precipitated Sulphur, Roll Sulphur, and Black Sulphur. There is no object in using any but the first named.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose .	1–4 oz.	½–2 oz.	½–3 drachms

Externally Sulphur is used as an ointment for mange and for many skin diseases. *Internally* it acts as a mild laxative, but is uncertain. It is a common ingredient of the so-called 'horse or condition powders.'

Sulphur Iodide.—Applied as an ointment is a powerful parasiticide.

Sulphurated Potash (*Liver of Sulphur*).—A powerful irritant and parasiticide. May be used as a lotion (Vleminckx' Solution) well diluted, or as an ointment (10 to 20 grains to an ounce of Lard).

Sulphuric Acid (*Oil of Vitriol*).—A corrosive acid now rarely employed directly in medicine.

Tannin.—*See* ACID, TANNIC.

Tar.—*Stockholm Tar* is a valuable skin remedy. It is antiseptic and disinfectant, but it does not afford any relief in itching complaints. May be tried in oint-

ments for most forms of eczema. *Oil of Tar* is of less value than Tar itself.

Coal Tar is only used in the form of a spirituous extract, the official Solution of Coal Tar, or the better known *Liquor Carbonis Detergens*. These contain all the remedial properties of Coal Tar in solution. On pouring into water they form a milky emulsion which is helpful in allaying many forms of skin irritation. Lotions may contain from ¼ to ½ fl. oz. to a pint of water; ointments from 10 to 20 drops to an ounce of Lard or Vaseline.

Tartar Emetic.—*See* ANTIMONY.

Tin Filings were at one time given to dogs for worms, but are not now recognised.

Turmeric.—A weak aromatic stimulant. Commonly added to horse and cattle tonic and condition powders. *Dose*, ½ to 1 oz.

Turpentine, Oil of.—Employed *externally* as a rubefacient, irritant, and counter-irritant in painful affections of the muscles and joints, neuralgia, inflammatory conditions of the chest, abdomen; it is of the greatest service in colic, enteritis, &c. The usual applications are flannel cloths recently wrung out in hot water and sprinkled with the oil. It should be remembered that Oil of Turpentine is irritating to the skin of horses, cattle, and dogs, frequently producing great excitement.

Internally it is diuretic, but somewhat of an irritant. Acts as a hæmostatic in gastric and intestinal hæmorrhage; in full doses is anthelmintic. Is commonly given for husk or hoose.

Dose (*diluted with Olive or Linseed Oil*).—Horses and cattle, ½ to 2 fl. oz.; sheep, ½ to 1 fl. dr. Rarely given to dogs—the dose not exceeding 20 drops diluted with oil.

NOTE.—*Common Turpentine* and *Venice Turpentine* are sometimes introduced into formulæ, but as they possess no advantage over the volatile oil treated above, it is unnecessary to discuss them.

Turpeth Mineral (*Mercury Subsulphate*).—Formerly given as an emetic, but now replaced by safer remedies.

Valerian.—Carminative, stimulant, and antispasmodic. May be tried in chorea and other nervous affections.

	Horses and Cattle	Sheep and Pigs	Dogs
Dose of the Powder	½–2 oz.	½–2 drachms	10–30 grains
Dose of the Tincture	½–1½ fl. oz.	½–1 fl. dr.	10–30 minims

Verdigris (*Subacetate of Copper*).—An irritant poison. Has practically dropped out of use. *Externally* it is a caustic detergent.

Zinc Chloride.—A powerful caustic and poison. In dilute solutions (1 in 1,000 to 1 in 500) it is used as an antiseptic stimulant to indolent wounds and ulcers. Pastes containing from 25 to 50 per cent. are used to destroy warts, &c., but they occasion much pain.

Zinc Oxide.—Mildly astringent and stimulant ; may be employed as a dusting powder—either alone or diluted with Starch or Kaolin—for sores, excoriations, eczema, &c. Zinc ointment is a serviceable application for burns, eczema, and many skin affections. Zinc Oxide coloured with iron is known as Calamine.

Zinc Sulphate (*White Vitriol*). —Ten to twenty grains in warm water acts as an emetic on cattle ; for dogs the dose may be 2 to 5 grains. *Externally* it is employed in lotions for its astringent and slightly antiseptic effects on ulcers, sores. Eye lotions should not be made stronger than 20 grains to a pint of water.

VETERINARY FORMULARY

DISEASES OF THE HORSE

BIG LEG, OR WATER FARCY

(Shakes, or Shivers)

A non-contagious disease, occasionally confounded with glanders or farcy, brought on by over-feeding with rich and heating foods. It commonly attacks hard-working cart-horses, &c., after the Sunday's rest. One or more of the animal's legs become swollen and very stiff and sensitive.

TREATMENT—

Potassium Nitrate . .	1 dr.
Barbadoes Aloes . .	½ oz.
Oil of Turpentine . .	3 fl. oz.
Linseed Oil . . .	1 pint

The draught to be given at once.

Make a fomentation of an ounce of Sugar of Lead to a gallon of hot water, and thoroughly bathe the affected limbs. Bandage in woollen bandage. Keep the animal warm, and allow plenty of bedding. Exercise as soon as possible.

BOTS

Bots are the larvæ of a species of gadfly (*Æstrus equi*). The eggs are swallowed by the horse when licking himself, the escaping larvæ fixing themselves to the lining of the stomach, from which they detach themselves in the following summer. Medicine is of little use, although a dose of two or three fluid ounces of Oil of Turpentine in half a pint or more of Linseed or Olive Oil is credited with destroying them.

Fundament bots are secreted just inside the anus, the insect depositing its eggs when the membrane is exposed during dunging. These bots frequently cause itchy tail. Some are killed by the occasional application of Mercurial (Troopers') Ointment. They can, however, only be eradicated by picking them out with a pair of blunt-nosed forceps as the folds of membrane are exposed during defæcation.

BROKEN WIND

The pathological condition known as broken wind is not thoroughly understood, but is believed to be caused by indigestion. Careful dieting is of immense benefit. The food must be of the best and slightly damped. Arsenic, Digitalis, Belladonna, Camphor, Tar, Fats, and Oils, have all been recorded as useful.

1. Powdered Camphor . . 1 dr.
   Powdered Benzoin . . 1 ,,
   Arsenious Acid . . . 3 gr.
   Lard . . . . . ¼ oz.
   Tar,
   Powdered Aniseed . of each sufficient to make into a ball

To be given every night.

2. Powdered Digitalis . . 1 dr.
   Powdered Camphor . . 1 ,,
   Extract of Belladonna . . 1 ,,
   Lard . . . . . ¼ ,,
   Powdered Aniseed,
   Tar . . . of each sufficient to make into a ball

BRONCHITIS

(Inflammation of the Bronchial Mucous Membrane)

See also PLEURISY and PNEUMONIA

Brought on by chills, and generally characterised by shivering, followed or accompanied by cough and fever. Breathing is noisy. Exposure to a dusty atmosphere may bring on an attack.

TREATMENT.—Keep warm, and if the attack is acute a steam kettle should be set going in the stable so as to render the atmosphere moist. The liquid known as Cresylic Acid may also be vaporised in the stable, in the same way as it is used for human beings. Keep the animal well clothed.

Give bran mashes occasionally with a tablespoonful of powdered aniseed or fœnugreek, scalded corn, &c., and do not allow the horse to have *dry* hay, or, indeed, any dry or dusty food.

1. Ammonium Carbonate . 1 dr.
   Potassium Iodide . . 1 ,,
   Powdered Squill . . . ½ ,,
   Powdered Ipecacuanha . ½ ,,
   Honey . . . . to form a confection.

To be given morning and evening, by placing on the back of the tongue with a broad bladed paper or palette knife.

2. Antimonial Wine . . ¼ fl. oz.
Extract of Belladonna . . 1 dr.
Powdered Digitalis . . 1 ,,
Potassium Citrate . . ½ oz.
Honey or Treacle . . to form a confection.

To be given twice a day.

3. Extract of Belladonna . . 1 dr.
Powdered Squill . . . ½ ,,
Ammonium Carbonate . 1 ,,
Sweet Spirit of Nitre . . 4 fl. dr.
Treacle or Honey . . to form a confection.

To be given twice a day.

CATARRH

(Cold)

The horse refuses food, arches his back, the coat stands up, and if the cold is severe the animal may be subject to shivering fits, cough, and running at the nose.

TREATMENT.—Keep the animal warm, pull ears and bandage legs, and give a bran mash. In slight cases, this with two or three days' rest may prove sufficient.

In cases of severe cold give the horse a bran mash to which has been added

Sodium Sulphate . . ½ lb.
Sweet Spirit of Nitre . . 1 fl. oz.
Powdered Nitre . . ¼ oz.
Powdered Fœnugreek . . 1 oz.

or

Epsom Salt . . . ½ lb.
Sodium Salicylate . . ¼ oz.
Tincture of Aconite . . 20 drops
Powdered Aniseed . . 1 oz.

If there is much discharge from the nostrils, bathe with Borax solution (¼ oz. to a pint of warm water) and anoint the muzzle with Lard or Vaseline.

If the horse coughs and refuses food, or after trying to eat rejects it, it is probably suffering from sore throat. This may be greatly relieved by free applications of some stimulating liniment to the outside of the throat :

1. Aconite Liniment . . 2 fl. oz.
Oil of Turpentine . . 6 ,,

2. Aconite Liniment . . 1 fl. oz.
Belladonna Liniment . . 1 ,,
Oil of Turpentine . . 3 ,,
Acetic Acid (strongest) . 1 ,,

3. Soap Liniment,
Belladonna Liniment,
Aconite Liniment . . of each equal parts

If none of these is at hand, make a thin cream of Mustard, stir in a little oil, and apply freely to the outside of the throat.

Tonic during Convalescence

Quinine Sulphate	.	40 grains
Powdered Aniseed	.	¼ oz.
Powdered Gentian	.	½ ,,
Treacle and Soap	.	to make one ball

To be given every day for a week.

COLIC

(Spasmodic and Flatulent Colic ; Gripes)

Attacks of colic are more general in hot than in cold weather, and generally come on when a horse is in an exhausted condition. Copious draughts of *cold* water while the animal is hot may bring on an attack, but there is no reason to withhold *tepid* water from a thirsty animal.

The horse should be kept warm, and allowed plenty of straw and room to roll about. It should *not* be walked about. As the acute pain (the attacks and remissions of which alternate) is due to spasmodic contraction of the intestinal muscles, relief is obtained by the administration of carminative and diffusible stimulants. The introduction of tobacco into the sheath or ginger into the rectum is worse than useless. If, owing to the acuteness of the spasms the gut becomes twisted or involuted, a fatal result is almost certain. Injection of a quart of hot water (as hot as can be comfortably borne by the bare arm) is sometimes of service, especially if the hand and arm are well greased and the rectum emptied of dung. *Compare the symptoms of enteritis.*

Treatment of Spasmodic Colic.—

1. Chlorodyne . . . ½ fl. oz.
Sweet Spirit of Nitre . . 1 ,,
Warm Water . . . 5 ,,

For one draught.

2. Tincture of Opium . . ¾ fl. oz.
Oil of Turpentine . . 1 ,,
Spirit of Chloroform . . ½ ,,
Sweet Spirit of Nitre . . ½ ,,
Linseed or Olive Oil . . ½ pint

For one draught.

3.	Tincture of Opium	1 fl. oz.
	Oil of Clove	20 drops
	Spirit of Camphor	¼ fl. oz.
	Oil of Turpentine	1 ,,
	Linseed or Olive Oil	½ pint

For one draught.

4.	Oil of Peppermint	30 drops
	Ether	½ fl. oz.
	Chlorodyne	½ ,,
	Warm Water	5 ,,

For one draught.

If none of the foregoing or similar remedies is at hand, a very useful carminative drink may be extemporised by pouring about ¾ pint of boiling water on a heaped teaspoonful each of crushed Pepper, Clove, Nutmeg, Caraway and Ginger, adding an ounce of Oil of Turpentine, and a few tablespoonfuls of brandy or whisky. Stir well, and when sufficiently cool, give the whole mixture. This may be repeated in a couple of hours or less without danger.

Flatulent Colic.—This is frequently the result of indigestion brought on by improper food or over-feeding. Green food, especially if it has become heated, is a frequent cause of flatulent colic to stall-fed horses. The belly is distended with gas, and sounds like a drum when tapped. Carminative drinks with Ammonia are the most useful. Applications of Oil of Turpentine and stimulating liniments to the belly also do good. If the pulse becomes very rapid, the belly tender, and the pain continuous, inflammation of the bowels is to be apprehended.

TREATMENT.—

1.	Solution of Ammonia	1 fl. oz.
	Powdered Aloes	3 oz.
	Oil of Turpentine	1 fl. oz.
	Tincture of Opium	¾ ,,
	Essence of Ginger	¼ ,,
	Warm Water	½ pint
2.	Solution of Ammonia	1 fl. oz.
	Tincture of Aconite	25 drops
	Tincture of Opium	¾ fl. oz.
	Tincture of Asafetida	¾ ,,
	Linseed Oil	½ pint
3.	Oil of Peppermint	20 drops
	Solution of Ammonia	1 fl. oz.
	Oil of Turpentine	1 ,,
	Compound Tincture of Cardamoms	1 ,,
	Warm Water	½ pint

Unless the case is a very bad one, any of the foregoing prescriptions will probably afford relief ; but if they have failed, a few doses of Laudanum or Chlorodyne with a diffusible stimulant should be tried :

4.	Tincture of Opium	¾ fl. oz.
	Spirit of Ether	½ ,,
	Oil of Turpentine	1 ,,
	Warm Water	½ pint

Give every hour for three hours.

5.	Chlorodyne	½ fl. oz.
	Ether	¼ ,,
	Oil of Peppermint	20 drops
	Warm Water	½ fl. oz.

Give every hour for three hours.

Liniments for Applying to the Belly in case of Colic

1.	Oil of Turpentine	5 fl. oz.
	Solution of Ammonia	1½ ,,
	Soap Liniment	1½ ,,
2.	Turpentine Liniment	4 fl. oz.
	Soap Liniment	4 ,,
	Expressed Oil of Mustard	4 ,,

CONGESTION OF THE LUNGS

A condition of the pulmonary vessels frequently induced by some extraordinary exertion, although it may result from a chill. The horse shivers ; legs and ears are cold, breathing hurried, pulse weak and irregular. If nothing else is at hand, give half a pint of whisky or brandy in a pint of water. Mustard should also be applied to the chest, as directed under 'Pneumonia.' Either of the following draughts is better than plain spirits :

1.	Spirit of Sal Volatile	1 fl. oz.
	Tincture of Digitalis	2 fl. dr.
	Sweet Spirit of Nitre	1 fl. oz.
	Ether	1 ,,
	Water	1 pint

Give at once, and repeat in four hours if necessary.

2.	Spirit of Sal Volatile	1 fl. oz.
	Tincture of Opium	½ ,,
	Tincture of Digitalis	1 fl. dr.
	Ether	1 fl. oz.
	Chloroform Water	1 pint

CONSTIPATION

The simplest laxative is a bran mash. Half a pint to a pint of Linseed or Olive Oil is also a safe and generally an effectual remedy. Some grooms add a little Oil of Turpentine, but not more than two tablespoonfuls should be added to the dose of Linseed Oil.

Physic or Aloetic Balls.—The active ingredient is Barbadoes Aloes, of which a light horse can take about ½ oz., while a heavy cart-horse may require ¾ to 1 oz. The ' mass ' should be kept in a jar with a well-fitting lid, the requisite quantity being weighed out as required.

Physic or Aloetic Mass

1. Barbadoes Aloes . . 8 oz.
   Powdered Ginger . . 1 ,,
   Powdered Clove . . ¼ ,,
   Glycerin . . . . 1 fl. oz.
   Olive Oil . . . . 1 ,,

Melt together over a water-bath and stir until evenly mixed. *Dose*: ¾ to 1½ oz.

2. Barbadoes Aloes . . 24 oz.
   Yellow Soap . . . 12 ,,
   Powdered Ginger . . 4 ,,
   Glycerin . . . . 2 fl. oz.

Melt and mix as No. 1. *Dose*: ¾ to 1½ oz.

NOTE.—Keep the horse on bran mashes for a day before administering a physic-ball, with as much tepid water as the animal will drink. Exercise gently before the aperient acts, but not afterwards. Purging generally commences in sixteen to twenty hours, and no work must be done during this period. The dose should not be repeated under a week.

If the ball is wrapped in paper it must be removed.

COUGH

Coughing may be induced by the presence of a foreign body, inflammation, acute or chronic irritation of the larynx.

TREATMENT.—Remove all hard and dry food. See that the stable is free from dust. An occasional bran mash is useful to which has been added ¼ lb. of Epsom Salt and an ounce of powdered Aniseed. Keep warm, but allow plenty of air without creating a draught. Smearing the throat with one of the liniments given under ' Catarrh ' sometimes affords relief.

Medicine should not take the form of cough balls,

although sanctioned by antiquity. Soft confections that can be smeared on the back of the tongue with a broad-bladed paper knife are much to be preferred ; moreover, the danger of a ball being coughed back into the nose is avoided.

1. Dover's Powder . . . 2 dr.
   Powdered Squill . . 1 ,,
   Extract of Belladonna . ½ ,,
   Treacle . sufficient to form a soft paste

Give once a day.

2. Powdered Senega . . 1 dr.
   Powdered Squill . . 1 ,,
   Extract of Belladonna . . ½ ,,
   Camphor . . . . ½ ,,
   Honey or Treacle . to form a soft paste

Give once a day.

3. Powdered Ipecacuanha . 1 dr.
   Diamorphine Hydrochloride . 3 gr.
   Powdered Digitalis . . 1 dr.
D.D.A. Honey . . . to form a soft paste

Give once a day.

NOTE.—If Diamorphine is not available, 10 gr. doses of Codeine may be substituted. Both give very good results in cough.

CYSTITIS

(Inflammation of the Bladder)

Urination is difficult or impossible, although the animal makes many attempts. Temperature is high, pulse small and rapid ; there is much thirst ; the horse frequently looks at its flanks and rarely lies down.

TREATMENT.—Allow plenty of tepid barley water slightly acidulated with lemon juice ; inject warm barley water ; give doses of two teaspoonfuls of Tincture of Belladonna in water three times a day for two days, then cut down to one teaspoonful. Poultices or hot cloths applied to the loins are helpful.

During convalescence let two tablespoonfuls of the following powder be mixed with the food twice a day :

Powdered Cinchona . . 1 oz.
,, Gentian . . 1 ,,
,, Grains of Paradise 1 ,,
,, Fœnugreek . . 2 ,,
,, Cumin Seed . . 1 ,,
Ferrous Carbonate . . 1 ,,

DIARRHŒA

(Purging, or Scouring)

Adult diarrhœa, when arising from improper food, generally ceases when the cause is removed. The horse should be clothed and kept warm and quiet, and only allowed tepid water. Food must be perfectly sound and readily digestible, such as kibbled oats and beans. Do not give bran, turnips, carrots, or green food.

Astringent Draughts

1. Tincture of Opium . . ½ fl. oz.
   Prepared Chalk . . . ½ oz.
   Bismuth Carbonate . . ½ ,,
   Tincture of Catechu . . 1 fl. oz.
   Oil of Clove . . . 10 drops
   Warm Water . . . ½ pint

   To be given every six or eight hours.

2. Chlorodyne . . . ½ fl. oz.
   Bismuth Carbonate . . 1 oz.
   Tincture of Catechu . . 1 fl. oz.
   Tannic Acid . . . 20 gr.
   Peppermint Water . . ½ pint

   To be given every six or eight hours.

Astringent Balls

1. Powdered Opium . . 40 gr.
   Bismuth Carbonate . . ½ oz.
   Powdered Catechu . . ½ ,,
   Oil of Clove . . . 10 drops
D.D.A. Glycerin or Soft Soap . . a sufficiency

   To be given every eight hours.

2. Powdered Opium . . 40 gr.
   Powdered Alum . . ½ oz.
   Powdered Cinchona Bark . ½ ,,
   Oil of Peppermint . . 10 drops
D.D.A. Glycerin or Soft Soap . . a sufficiency

   To be given every eight hours.

NOTE.—If none of the foregoing remedies is at hand, give a few tablespoonfuls of chalk or whiting, with a little pepper and mustard, in half a pint of warm milk. Chalk is a most useful astringent.

ENTERITIS

(Inflammation of the Membranous Lining of the Intestines)

Enteritis is generally fatal. The pulse is quick and small (in colic it is scarcely affected), eyelids are red

inside, ears and legs are cold, belly very tender, urine scanty and high coloured. There is no remission of the pain, and the animal entirely refuses food.

TREATMENT.—The horse should be kept warm, ears pulled, legs rubbed and bandaged in woollen bandages. Hot cloths, sprinkled with Mustard or Oil of Turpentine should be kept applied to the belly.

1. Calomel . . . . 1 dr.
D.D.A. Powdered Opium . . 1 ,,

Mix. About half an hour afterwards give half a pint Linseed or Olive Oil.

2. Tincture of Opium . . 1 fl. oz.
Essence of Ginger . . ½ fl. dr.
D.D.A. Oil of Peppermint . . 10 drops

Give in a quarter of a pint of Linseed Oil every hour for four hours.

3. Chlorodyne, one teaspoonful in a little warm water every hour for several hours.

Frequent injections of warm water into the rectum are useful.

FEVER

Horses sometimes exhibit feverish symptoms without any *apparent* specific derangement. In such cases it is nearly always safe to clothe the animal and give a diffusible stimulant draught. This, followed by one or two tonic balls—the bowels being opened with a bran mash to which ½ lb. Epsom Salt and a little powdered Fœnugreek have been added—frequently ensures a quick return to health. Give scalded corn, barley or linseed mashes.

1. Ether . . . . 1 fl. oz.
Tincture of Digitalis . . 2 fl. dr.
Chloroform Water . . ¾ pint

2. Spirit of Sal Volatile . . 1 fl. oz.
Tincture of Digitalis . . 2 fl. dr.
Compound Tincture of Cardamoms . . 2 fl. oz.
Chloroform Water . . ¾ pint

3. Sweet Spirit of Nitre . . 1 fl. oz.
Compound Tincture of Cardamoms . . . . 2 ,,
Tincture of Belladonna . ½ ,,
Water . . . . ¾ pint

4. Ether . . . . 1 fl. oz.
Spirit of Sal Volatile . . 1 ,,
Compound Tincture of Gentian . . . . 2 ,,
Peppermint Water . . ¾ pint.

GLANDERS AND FARCY

See Contagious Diseases Act.

INFLAMMATION OF THE LIVER

(Hepatitis)

TREATMENT.—From ¾ to 1 oz. of ordinary physic or aloetic mass, followed after a proper interval by salines.

Saline Draughts

1. Epsom Salt . . . 4 oz.
Ammonium Chloride . . ½ ,,
Sodium Bicarbonate . . 1 ,,
Sodium and Potassium Tartrate . . . . 2 ,,
Peppermint Water . . 1 pint

To be given every morning; or, night and morning.

2. Glauber's Salt . . . 6 oz.
Ammonium Chloride . . ½ ,,
Sodium Bicarbonate . . 1 ,,
Potassium Citrate . . ¾ ,,
Aniseed Water . . . 1 pint

To be given every morning; or, night and morning.

After improvement has commenced give half the dose of No. 2, substituting strong Infusion of Gentian for the Aniseed Water. The infusion is made by pouring 1 pint of boiling water on 2 oz. of crushed Gentian and allowing it to stand for twelve hours, then squeezing out the liquor.

INFLAMMATION OF THE STOMACH

(Gastritis)

Often caused by the administration of Antimony, Arsenic, or other drugs. If possible, remove the cause; see that oats, beans, &c., are quite sound and well crushed or scalded. Let the chill be taken off the drinking-water. Give one of the following draughts:

1. Sodium Bicarbonate . . 1 oz.
Powdered Gentian . . 1 dr.
Dilute Prussic Acid, B.P. . 30 drops
Warm Water . . . 1 pint

To be administered twice a day.

2. Potassium Bicarbonate . 1 oz.
Potassium Bromide . . ¼ ,,
Dilute Prussic Acid, B.P. . 30 drops
Warm Water . . . 1 pint

To be administered twice a day.

As the horse improves, the following tonic is helpful in stimulating appetite :

Tincture of Nux Vomica . 2 fl. dr.
Dilute Sulphuric Acid . . 4 ,,
Warm Water . . . ½ pint

To be given every morning for a week.

JAUNDICE, OR YELLOWS

Saline purgatives are indicated. Physic or aloetic balls do harm. Give plenty of green food, carrots, apples, &c. Induce skin to act by gentle exercise.

1. Epsom Salt . . . 4 to 6 oz.
Powdered Ginger . . 1 dr.
Warm Water . . . 1 pint

The Draught. To be given every morning until the bowels respond freely.

2. Epsom Salt . . . 4 to 6 oz.
Ammonium Chloride . . ½ oz.
Powdered Gentian . . ¼ oz.
Aniseed Water . . . 1 pint

The Draught. To be given every morning until the bowels act freely ; then the Epsom Salt should be reduced to one quarter and the treatment continued for a week or more.

Tonic Ball after Jaundice

Powdered Gentian,
,, Chamomile,
,, Ginger . of each 1 dr.
Glycerin and Soft Soap . a sufficiency

For one ball. To be given every night.

Tonic Powder

Powdered Gentian,
,, Calumba,
,, Aniseed,
,, Fœnugreek . of each equal parts

A tablespoonful to be mixed with the morning and evening meal of corn, &c.

LAMENESS IN HORSES

Corns.—Corns should be pared regularly. If the corn is a bad one and discharges, lay bare, soak the foot in hot Boric Acid lotion as directed under ' Pricks,' and apply a Kaolin poultice (*see* ' Veterinary Materia Medica '). When discharge ceases dress the place with Zinc Ointment containing a drachm of Tar to each ounce.

Cracked Heels.—Do not wash the horse's legs after returning from work, but allow to dry, brushing dirt out afterwards. If the case is not a bad one, apply one of the following :

1.	Goulard's Extract . .	1 fl. oz.
	New Milk	1 pint
2.	Goulard's Extract . .	1 fl. oz.
	Lime Water . . .	5 ,,
	Olive Oil or Linseed Oil .	¾ pint
3.	Goulard's Extract . .	½ fl. oz.
	Glycerin	1 ,,
	Carbolic Acid . . .	1 dr.
	New Milk	1 pint
4.	Powdered Starch . .	1 oz.
	Carbolic Acid . . .	1 dr.
	Zinc Ointment . . .	4 oz.

If the case is a bad one, apply hot bran poultices, or, what is very much better, Kaolin poultices, made as directed under ' Veterinary Materia Medica.'

Over-tread, or Over-reach.—The animal must be rested, and the wounded coronet bathed with warm Boric Acid lotion (½ oz. to a pint). One or two dressings with ' Kaolin Poultice ' (*q.v.*) quickly reduce inflammation, when the place may be covered with *stiff* Boric Acid Ointment containing a few drops of Creosote to each ounce.

Pricks.—Remove shoe and open up nail-hole very carefully for any discharge to get away. Make a lotion of 4 oz. of Boric Acid and a gallon of hot water. Keep the foot in this for an hour or so, then apply Kaolin poultices, described under ' Veterinary Materia Medica.' Renew the poultices daily until discharge ceases, then dress the wound with a mixture of—

Boric Ointment . . .	1 oz.
Zinc Ointment . . .	1 ,,
Yellow Wax . . .	1 dr.

If Kaolin poultice cannot be had, apply Linseed or bran poultices, although they are not nearly as efficient.

Ring Bones and Side Bones.—If in very early stage apply cold Kaolin poultices, or a soothing lotion as the following. Rest the horse and turn out to grass.

1.	Goulard's Extract . .	1 fl. oz.
	Methylated Spirit . .	2 ,,
	Water	1 pint
2.	Goulard's Extract . .	1 fl. oz.
	Solution of Ammonium Acetate	3 ,,
	Methylated Spirit . .	2 ,,
	Water	1 pint

Blistering generally does good. If the case is an old one use Biniodide of Mercury blister; if recent, then a Cantharides blister usually suffices (*see* Blisters, under 'Veterinary Materia Medica'). The third day after blistering apply Boric Ointment, *half-strength.*

Spavin.—Generally treated with either Biniodide of Mercury or Cantharides blisters, the animal being turned out to grass for a considerable period. Many spavined horses seem to work for years without breaking down, although such animals are, of course, unsound. 'Firing' is the last resource.

Sprains.—If the sprain is only a slight one, apply cold water dressings, containing two tablespoonfuls of Methylated Spirit to each pint, for a considerable time; after a day or two using the following liniment morning and evening. Do not apply too much at a time, and only employ moderate friction.

Turpentine Liniment,
Ammonia Liniment,
Soap Liniment . . . of each equal parts

Should the sprain be severe with considerable inflammation, use hot fomentations continuously for some hours, *gradually reducing the temperature* of the water until it is only lukewarm. A teaspoonful of Fluid Extract of Belladonna may be added to each quart with advantage.

After inflammation has subsided rub very gently with the liniment given above, at first once daily, afterwards with more vigour twice daily.

Keep the bowels open with bran mashes.

Thrush.—Most cases of thrush are caused by overparing at the time of shoeing. Treatment consists in washing the foot with warm Boric Acid lotion (½ oz. to 1 pint water), at the same time removing all loose pieces of horn. One of the following ointments should then be applied:

1. Powdered Boric Acid . . 1 oz.
   Common Salt . . . 1 ,,
   Lard . . . . 2 ,,
   Stockholm Tar . . . 2 ,,

2. Calomel . . . . ½ oz.
   Boric Acid. . . . ½ ,,
   Zinc Ointment . . . 4 ,,

MEGRIMS

A disease resembling epilepsy. No known treatment appears to be of benefit.

MUD FEVER

Reputed to be induced by close-clipping and washing the legs at night after work in muddy weather.

TREATMENT.—Do not clip the legs. Allow mud to dry on and *brush* off next morning. If there is much fever, give 20-drop dose of Tincture of Aconite. Let the bowels be opened with a bran mash. Linseed and barley mashes and scalded corn are also excellent.

The legs must *not* be washed or scrubbed. First treatment consists in bathing with Glycerin and warm water (about 1 pint to a gallon) and then gently drying. Afterwards apply one of the following :

1. Carbolised Oil 3 per cent.

2. Carbolic Acid . . . 1½ dr.
   Glycerin . . . . 1 fl. oz.
   Water . . . . ½ pint

3. Goulard's Extract . . 1 fl. oz.
   Carbolic Acid . . . 1 dr.
   Fresh Milk. . . . ½ pint

Shake vigorously before use. This is a most soothing and healing application.

4. Solution of Coal Tar . . ½ fl. oz.
   Olive Oil . . . . ½ pint
   Goulard's Extract . . 1 fl. oz.

Shake vigorously before use.

As improvement takes place, exercise the animal gently and give a tonic ball every night :

Tonic Balls

1. Quinine Sulphate . . ½ dr.
   Powdered Gentian . . ¼ oz.
   ,, Fœnugreek . ¼ ,,
   Treacle . . . sufficient to make a ball

2. Powdered Cinchona . . ½ oz.
,, Quassia . . 1 dr.
,, Aniseed . . ½ oz.
,, Gentian . . ¼ ,,
Treacle . . . sufficient to make a ball

Tonic Powder

Powdered Gentian,
,, Cinchona,
,, Aniseed,
,, Fœnugreek,
,, Salt . of each 2 oz.
Ferrous Carbonate . 1 ,,

Two tablespoonfuls to be mixed with the food twice a day.

PINK EYE

This is a form of influenza which may manifest itself in many different ways, attacking the lungs, liver, &c.

TREATMENT.—The animal, having been isolated, should at once be given a diffusible stimulant, and placed in a warm *airy* box or stable.

Ammonium Carbonate . ¼ oz.
Powdered Ipecacuanha . 1 dr.
Sweet Spirit of Nitre . . 1 fl. oz.
Warm Water . . . ½ pint

Open the bowels with bran mash to which ½ lb. Epsom Salt and a little powdered Fœnugreek have been added. Let the animal have carrots, linseed mash, scalded corn, &c. During convalescence tonics, such as the following, are indicated. Exercise by degrees.

1. Powdered Cinchona . . ½ oz.
Extract of Gentian . . ½ ,,
Extract of Belladonna . . ½ dr.

For one ball, to be given every morning.

2. Quinine Sulphate . . 2 dr.
Powdered Aniseed . . ½ oz.
Powdered Caraway . . ¼ ,,

For one ball, to be given every morning.

PLEURISY, OR PLEURITIS

(Inflammation of the Serous Membrane Covering of the Lungs)

This is a disease to which horses are particularly subject. Exposure to cold winds, especially when heated, is a frequent cause. On account of the tenderness when the

ribs are pressed, stablemen frequently confuse pleurisy with colic, but whereas animals suffering from gripes lie down and roll about, in chest affections they get more ease while standing with the head low. Other symptoms are much the same as in pneumonia.

TREATMENT.—Apply Mustard over the chest as directed under ' Pneumonia.' Or apply—

Essential Oil of Mustard	½ fl. dr.
Acetic Liniment of Turpentine	to make 4 oz.

Great relief, as in the human subject, is experienced by the frequent application of rugs that have just been wrung out in boiling water. The bowels should be kept open with bran mashes to which *a little* Epsom Salt may be added. As there is generally some effusion, the following mixtures are serviceable :

1.

Ammonium Carbonate	1 dr.
Potassium Iodide	2 ,,
Potassium Nitrate	2 ,,
Powdered Caraway	2 ,,
Soap and Treacle	sufficient to form a ball

To be given every night.

2.

Ammonium Carbonate	1 dr.
Potassium Iodide	2 ,,
Powdered Gentian	2 ,,
Extract of Belladonna	1 ,,
Soap and Treacle	sufficient to form a ball

To be given every night.

PNEUMONIA

(Inflammation of the Lungs)

Frequently the result of a neglected cold. Temperature is high, respiration hurried, extremities cold ; the horse hangs the head, refuses food, and rarely lies down.

TREATMENT.—*Keep bowels open with bran mashes, if necessary, adding not more than ¼ lb. Epsom Salt and a tablespoonful of powdered Fœnugreek.* Do not give ordinary aloetic (physic) balls. While avoiding draughts see that ventilation is efficient. Allow as much tepid water as the horse will drink ; food must be light, as linseed and oatmeal gruel, &c.

In the early stages counter-irritation is almost always beneficial, and is best employed in the form of thin Mustard. Make a thin cream with tepid (*not hot*) water and apply thoroughly to both sides of the chest. Rubbing in is assisted by adding a few spoonfuls of Olive Oil.

As in bronchitis, draughts and balls frequently cause coughing: the medicine should whenever possible be given in the form of a confection placed on the back of the animal's tongue.

1. Tincture of Aconite . . 20 drops
   Ammonium Carbonate . 1 dr.
   Potassium Citrate . . ¾ oz.
   Honey or Treacle . sufficient to form a confection

Give night and morning until temperature falls.

2. Tincture of Aconite . . 25 drops
   Powdered Digitalis . . 1 dr.
   Ammonium Carbonate . 1 ,,
   Sweet Spirit of Nitre . . ½ fl. oz.
   Honey or Treacle . sufficient to form a confection

Secondary treatment after temperature falls:

3. Rectified Ether . . . ¼ fl. oz.
   Potassium Iodide . . 1 dr.
   Ammonium Carbonate . 1 ,,
   Powdered Gentian . . 2 ,,
   Honey . . . sufficient to form a confection

To be given night and morning.

Tonic Balls to be given during Convalescence

4. Powdered Cinchona . . ¼ oz.
   Powdered Gentian . . ¼ ,,
   Powdered Aniseed . . 1 dr.
   Powdered Benzoin . . ½ ,,
   Treacle and Soap . of each sufficient to form a ball

5. Quinine Sulphate . . 1 dr.
   Powdered Caraway . . ¼ oz.
   Powdered Gentian . . ¼ ,,
   Treacle and Soap . of each sufficient to form a ball

SKIN DISEASES

Acne is caused by a parasite. Rubbing of the harness often sets up a condition favourable to an attack. When the pustules break, the places may be dressed with equal parts of Carbolic and Resin Ointments. A tablespoonful of Sulphur may be added to the animal's food.

Eczema.—Many skin affections are spoken of as eczema, especially by the laity. Where there is an

eruption of tiny vesicles or pimples which break and run together, forming a scabby mass, change of food, especially green stuff, carrots, &c., generally causes improvement. The affected places should be thoroughly washed with soft soap and water, dried, and anointed with one of the following ointments. The bowels should be kept open with a bran mash to which ½ lb. Epsom Salt has been added.

1. Zinc Ointment.
2. Carbolic Ointment.
3. Zinc Ointment . . . 2 oz.
   Carbolic Ointment . . 2 ,,
   Sulphur Ointment . . 1 ,,
4. Carbolic Ointment . . 2 oz.
   Sulphur Ointment . . 1 ,,
   Tar Ointment . . . 1 ,,

A ball made as follows may be given once a day, immediately after food, for a fortnight:

Antimony Sulphide . . ½ dr.
Sulphur . . . . ¾ oz.
Treacle . . sufficient to form a ball

Itchy Tail.—This is generally caused by parasites. Bots (*q.v.*) are killed by introducing Mercurial (Troopers') Ointment into the rectum and smearing the anus; *internal* parasites by frequent injections of salt solution (three or four tablespoonfuls to a quart of warm water). The seat of the tail may be bathed with any of the lotions given under 'Pityriasis.' Let the animal have an aloetic or physic ball.

Mallenders and Sallenders, an eczematous affection of the knee and hock, may be treated as above, but if the disease is of long standing either of the following ointments may be tried:

1. Carbolic Ointment . . 1 oz.
   Mercuric Oxide Ointment . 1 oz.
2. Dilute Nitrate of Mercury Ointment.

Mange.—Mange is a contagious parasitic disease which generally yields to Sulphur. It results from the burrowings of acari, and a cure can only be effected by destroying them both on the animal and on every article with which the horse comes into contact.

1. Sulphur . . . . 4 oz.
   Oil of Eucalyptus . . 2 fl. oz.
   Oil of Tar . . . . 1 ,,
   Olive Oil . . . . 1 pint

2. Lysol . . . . 1 fl. oz.
   Sulphur . . . . 4 oz.
   Olive Oil . . . . 1 pint

Nettle-rash.—An attack generally comes on at change of coat, but may be induced by a chill, drinking cold water while in a heated condition, &c.

The pimples and lumps may spring up quite suddenly, and disappear without causing much trouble ; at other times the irritation will be intense, as shown by the animal trying to bite himself, rubbing against the stall, &c.

Rest is required, and an aloetic (physic) ball should be given. A dose of ½ lb. Epsom Salt every morning for three mornings is also good. Let the following powder in doses of two tablespoonfuls with each meal, be given every day for a week :

Powdered Nitre . . . 1 oz.
,, Sulphur . . 2 ,,
,, Fœnugreek . . 2 ,,
,, Aniseed . . 1 ,,
,, Salt . . . ½ ,,

The irritable places may be bathed frequently with any of the lotions given under ' Pityriasis.'

Pityriasis.—An irritable condition in which the skin is covered with a dry scaly eruption. Allow plenty of green stuff, carrots, &c. ; see that the hay is sound. Beans and peas seem to suit better than corn.

Treatment.—Try lotions first.

1. Carbolic Acid . . . 1 oz.
   Glycerin . . . . 2 fl. oz.
   Water . . . . ½ gal.

2. Carbolic Acid . . . 1 oz.
   Glycerin . . . . 2 fl. oz.
   Saturated Solution of Boric Acid . . . . ½ gal.

3. Liquor Carbonis Detergens . 1 fl. oz.
   Glycerin . . . . 2 ,,
   Goulard's *Water* . . ½ gal.

4. Dilute Prussic Acid . . ¼ fl. oz.
   Glycerin . . . . 1 ,,
   Boric Acid . . . . ½ oz.
   Water . . . . 1 qt.

Note.—Poison.

5. Carbolic Ointment,
Zinc Ointment,
Vaseline . . . of each equal parts

Prurigo, or **Pruritus.**—An irritable condition accompanied by violent itching. Any of the lotions and ointments given under ' Eczema ' and ' Pityriasis ' may be used, or

Sulphurated Potash (Liver of Sulphur). . . .	¼ lb.
Methylated Spirit . .	½ pint
Water to make . . .	1 gal.

Surfeit.—*See* NETTLE-RASH.

Urticaria.—*See* NETTLE-RASH.

SORE THROAT

Simple sore throat is nearly always benefited by poulticing. When this is not feasible apply a mixture of thin Mustard and ordinary Turpentine. Let the animal have plenty of tepid barley water acidulated with lemon juice ; keep bowels open with bran mash and ¼ lb. Epsom Salt.

A teaspoonful of one of the following confections *placed as far as possible on the back of the throat* is always helpful in cutting short the attack. Keep the animal warm and out of draughts.

1. Powdered Potassium Nitrate 1 oz.
Powdered Potassium Chlorate 1 ,,
Extract of Belladonna. . ¼ ,,
Treacle or Honey . sufficient to make an electuary.

A teaspoonful for a dose, given as above.

2. Sodium Salicylate . . 1 oz.
Powdered Borax. . . 1 ,,
Treacle . . . . a sufficiency

A teaspoonful for a dose, given as above.

When the throat is ulcerated

3. Thymol* . . . . 1 gr.
Chlorate of Potash . . 1 oz.
Borax . . . . 1 ,,
Treacle . . . . a sufficiency

A teaspoonful for a dose, given as above.

* This must be dissolved in a few drops of Spirit of Wine.

STAGGERS

(Abdominal Vertigo)

Grass Staggers occurs among young animals at grass, and is caused by impaction of the stomach. Relief of brain pressure must be effected at once by bleeding from the jugular vein or death may quickly ensue. If not serious the trouble may be alleviated by a purge.

Sleepy Staggers comes on more slowly. The usual treatment is a course of saline —Epsom Salt in plenty of warm water. Let the animal fast at first for at least twenty-four hours. Horses subject to staggers should never be turned out to grass.

STOMATITIS

(Inflammation of Mucous Membrane of the Mouth)

An eruption generally appears round the mouth. Insanitary stables and improper feeding are supposed to bring on an attack.

TREATMENT.—Sponge and rinse the mouth and lips with about two tablespoonfuls of Glycerin of Borax in half a pint of water.

Give ¼ lb. to ½ lb. of Sodium Sulphate (Glauber's Salt) in warm water early every morning before the animal eats.

STRANGLES

An infectious disease peculiar to young colts, especially when 'out at grass.' An abscess forms under the jaw, which at the proper time requires to be opened and evacuated.

During convalescence the 'Tonic Powder' given under 'Mud Fever' may be mixed with the food with advantage.

WORMS

Usually it is necessary to try several remedies when there is reason to believe that a horse is badly affected with worms. The stomach and intestines are generally infested with one or more species of these parasites and while some may come away with a brisk aloetic purge, others are removed only with the greatest difficulty. The remedies may be tried in the order given :

1. An aloetic ball (physic ball) given after preparation with a bran mash.
2. Liquid Extract of Male Fern, 2 to 4 fl. dr. given in ¼ pint of milk after the animal has fasted for twelve hours.

3. Santonin . . . . 1 dr.
Arsenic . . . . 5 gr.
Calomel . . . . 30 ,,
Ferrous Sulphate (Green Vitriol) . . . . 30 ,,
Powdered Gentian . . 2 dr.
Treacle . . . . a sufficiency

Make into a soft paste, and place as far back as possible on the animal's tongue. To be given after twelve hours' fast. Repeat after three days.

4. Santonin . . . . 1 dr.
Pelletierine Tannate . . 1 ,,
Calomel . . . . ½ ,,
Powdered Tansy. . . 2 ,,
Powdered Gentian . . 2 ,,

To be made into a paste with Treacle and given as No. 3.

5. Santonin . . . . 1 dr.
Barbadoes Aloes . . 1 ,,
Powdered Areca . . 2 ,,
Ferrous Sulphate . . 2 ,,
Treacle and Soap . . a sufficiency

DISEASES OF CATTLE

ANIMAL PARASITES ON THE SKIN

Itch.—Dress the animals with Sulphurated Lime solution, which may be made as follows :

Sulphur	1¼ lb.
Quicklime	10 oz.
Water	3 gals.

Boil in an iron vessel until the liquid assumes a dark red colour, making up any water lost by evaporation. Allow to settle, and pour off the clear liquid.

Cattle Itch is exceedingly infectious, and affected animals must be separated.

Lice may be effectually got rid of by covering the animal with Linseed or Sweet Oil. A less expensive method consists in dressing with any of the following :

1. Crushed Stavesacre Seeds . 2 lb.
   Water . . . . 1¼ gal.
   Boil until reduced to 1 gal. Strain.

2. Tobacco . . . . ¼ lb.
   Quassia . . . . 1 ,,
   Lysol . . . . 2 fl. oz.
   Soft Soap . . . . 1 oz.

Boil the Tobacco and Quassia in sufficient water to produce 1 gal. when strained. In this dissolve the Soap, then stir in the Lysol.

3. Oil of Sassafras . . . 1 fl. oz.
   Oil of Stavesacre . . . 1 ,,
   Kerosene . . . . 2 ,,
   Soft Soap . . . . ¼ lb.

Dissolve the Soap in a gallon of hot water, cool, and pour in the mixed Kerosene and oils. Stir.

Before applying any parasiticide it is necessary to brush the coat thoroughly with soft soap and water. Apply on a warm day, or there is risk of catching cold.

ANTHRAX

(Splenic Fever ; Splenic Apoplexy)

See Contagious Diseases Act.

BRONCHITIS

(Inflammation of the Bronchial Mucous Membrane)

TREATMENT as for bronchitis in horses.

BULL BURNT

TREATMENT.—Keep the bowels open with Epsom Salt, &c., and use the following injection :

Boric Acid . . .	1 dr.
Chinosol	10 gr.
Warm Water . . .	1 pint

Inject into the vagina, or, in case of a bull, into the sheath.

CATTLE PLAGUE

(Rinderpest ; Typhus Boum Contagiosus)

See Contagious Diseases Act.

CONSTIPATION

(Dung-bound, or Fardel-bound ; Stoppage)

This is not uncommon among stall-fed beasts. Bad food is a frequent cause, and impaction of the third stomach, or omasum, is the result. Constipation is obstinate, the animal is dull, and often gives a grunt with each breath. Occasionally the excreta consist of an offensive liquid containing hard lumps of impacted food.

TREATMENT.—A strong purgative, such as the following :

Epsom Salt . . .	1 lb.
Barbadoes Aloes . .	1 oz.
Powdered Ginger . .	1 ,,
Powdered Caraway . .	1 ,,

Mix with about a quart of hot water and give warm. Let the animal have plenty of tepid water. If the draught does not act in twelve hours, give a pint or two pints of Linseed Oil, followed by as much hot water as can be horned down.

When the bowels begin to act properly, allow soft food, mashes, &c., with but little hay for some time.

Two or three tablespoonfuls of the following powder with food are useful during convalescence :

Common Salt,
Powdered Gentian,
Powdered Aniseed,
Powdered Fœnugreek,
Powdered Cinchona . of each equal parts

COW-POX

Cow-pox is a contagious disease. More or less fever is present, accompanied by an eruption of the teats.

TREATMENT.—Cases should be at once separated from the herd, and the milk should not be sold for human consumption.

Epsom Salt . . .	½ lb.
Potassium Acetate . .	½ oz.
Potassium Bicarbonate .	1 ,,
Powdered Ginger . .	1 ,,

Give in warm gruel every night.

The teats should be bathed with Boric Acid lotion (½ oz. to a pint of water), and afterwards dressed with the following ointment :

Resin Ointment . . .	1 oz.
Boric Ointment . . .	1 ,,
Zinc Ointment . . .	1 ,,

Moist sores which do not yield to this treatment may be painted with Flexible Collodion containing a few grains of Benzoin to each fluid ounce.

DIARRHŒA

(Scouring)

Full grown beasts may have the same treatment as horses. *Calves*, especially when brought up by hand, frequently suffer from diarrhœa caused by improper feeding. The food supply should be at once rectified. It is always safe to give one to four tablespoonfuls of Castor Oil, according to size and age. This generally removes decomposing food, &c. If necessary give a dose of one of the following, and repeat on succeeding days if required :

1.	Sodium Bicarbonate . .	30 gr.
	Powdered Catechu . .	30 ,,
	Powdered Opium . .	5 ,,
D.D.A.	Powdered Ginger . .	10 ,,

Give in gruel.

2. Prepared Chalk . . . 60 gr.
Powdered Catechu . . 40 ,,
Powdered Opium . . 5 ,,
D.D.A. Oil of Caraway . . 5 min.

Give in gruel.

3. Bismuth Salicylate . . 30 gr.
Chlorodyne . . . 30 min.
Creosote . . . . 8 ,,

Give in gruel.

FOOT AND MOUTH DISEASE

(Eczema Contagiosa ; Aphthous Fever ; Epizootic Aphthæ Murrain)

See Contagious Diseases Act.

HOVEN

(Tympanites, or Blown)

Flatulent distension of the paunch (rumen), generally due to gorging with green food after stall feeding.

If the case is not a very bad one, give the following draught :

Solution of Ammonia sp. gr. 0·891 . . . . 1 fl. oz.
Creosote . . . . 1 fl. dr.
Oil of Peppermint . . 30 drops
Water . . . . 1 pint

If this causes absorption of the gases, it may be repeated in an hour. The Creosote will help to stop fermentation.

Doses of 1 oz. of Sodium Sulphite or common ' Hypo,' dissolved in a pint of water, also do good after reduction of the distension.

Should the case be obstinate, a probang must be passed and the gases drawn off. When this is impracticable, owing to the choking of the tube by food, the paunch must be pierced by means of a trocar. When either of these last has been resorted to it is necessary to give a draught similar to the above, following it up with anti-fermentative agents, as Sulphite of Soda, &c. The digestive functions may afterwards be stimulated by a few doses of the following :

Sodium Bicarbonate . . $\frac{3}{4}$ oz.
Solution of Ammonia . . $\frac{1}{4}$ fl. oz.
Powdered Gentian . . $\frac{1}{2}$ oz.
Powdered Aniseed . . 1 ,,

given in a pint or so of water.

HUSK, OR HOOSE

Hoose in calves is caused by the presence of a parasite, *Filaria bronchialis*, in the air passages.

TREATMENT.—Give

Oil of Turpentine	¾ to 1 fl. oz.
,, Clove	15 drops
Linseed Oil	¼ pint

To be given once a week until the cough ceases.

The parasites are destroyed much quicker and more certainly by inhalation. A simple inhaler is made by strapping a light wicker basket covered with flannel on to the nose of the calf and pouring about two tablespoonfuls of the following on to the flannel :

Oil of Turpentine	1 fl. oz.
,, Eucalyptus	30 drops
Carbolic Acid	60 ,,

Take care that the *inhaler* is so arranged that the medicament cannot come into contact with the nose or lips. Let the animal wear it for two or three minutes at a time, and repeat every three days until cured.

JAUNDICE

(Yellows)

The condition known as jaundice (pigmentation of the skin) follows biliary derangement. Cholagogue laxatives and diuretics should be administered.

TREATMENT.—

1.

Ammonium Chloride	½ oz.
Potassium Bicarbonate	1 ,,
Potassium Nitrate	½ ,,
Epsom Salt	½ lb.
Powdered Ginger	1 oz.

To be given in hot gruel. A few hours afterwards horn down plenty of hot water.

2.

Glauber's Salt	¾ lb.
Podophyllin	5 gr.
Potassium Nitrate	½ oz.
Powdered Rhubarb	1 ,,
Powdered Ginger	1 ,,

Give as above.

MAMMITIS

(Inflammation of the Udder ; Garget)

Foment the ' bag ' with warm Boric Acid lotion (¼ oz. to a pint). When thoroughly cleansed, inject dilute Chinosol lotion, as directed in milk fever, once daily. Afterwards the ' bag ' must be supported and well poulticed, about ¼ oz. of Extract of Belladonna being dissolved in the hot water used for each application. Draw off the milk several times a day.

INTERNAL TREATMENT consists in giving a laxative :

Glauber's Salt . .	1 lb.
Powdered Ginger .	1 oz.
,, Caraway .	1 ,,
Hot Gruel	1 quart

Afterwards, the following may be given twice a day until temperature falls :

Potassium Citrate . .	½ oz.
,, Bicarbonate .	¼ ,,
,, Iodide .	20 gr.
Gruel	1 pint

Stimulating liniment, to be massaged gently into the ' bag ' after temperature falls :

Camphorated Oil . .	½ pint
Tincture of Iodine .	1 fl. oz.
Soap Liniment to . .	½ pint

MILK

Bloody Milk.—May be caused by injury to the teats due to rough milking. Foment with hot water twice a day, and milk very gently.

Suppression of Milk.—This often follows indigestion. The following draught often does good.

TREATMENT.—

Sodium Bicarbonate . .	½ oz.
Ammonium Carbonate .	30 gr.
Powdered Gentian . .	¾ oz.
Powdered Cinchona . .	¼ ,,
Powdered Caraway . .	1 ,,
Gruel	½ pint

Give morning and evening.

PARTURIENT APOPLEXY

(Milk Fever)

Parturient apoplexy, or milk fever, only attacks recently calved cows. It may manifest itself immediately or after several days. Originally this malady was so little understood that many valuable animals were lost. It is now known to be caused by the development of a toxin in the milk glands, which produces a peculiar, and formerly fatal, intoxication. There is no rise of temperature.

TREATMENT.—Dissolve ¼ oz. of Chinosol in about a quart of recently boiled water. Inject while warm about half a pint into each teat. The teats should be first thoroughly cleansed with Chinosol solution (1 in 1,000), and the injecting syringe soaked in more of the same solution.

If these precautions are observed, recovery is practically assured.

Before the discovery of the action of Chinosol, Potassium Iodide (½ oz. to a quart of warm water) was injected in a similar manner. Cases are more likely to give trouble, however, under this treatment, as it is almost impossible to ensure perfect antisepsis. Potassium Iodide is but a feeble germicide, while Chinosol is a most active one.

PARTURIENT FEVER

Temperature is high and there is much pain. The cow suffers from shivering fits.

TREATMENT consists in applying hot fomentations or poultices *continuously* over the loins. If this is impracticable, apply the following liniment freely but gently :

Soap Liniment,
Solution of Ammonia,
Tincture of Belladonna . of each equal parts

The womb should be syringed very gently or irrigated with Chinosol solution (1 in 2,000) or Carbolic Acid lotion (1 in 1,000).

Give plenty of warm gruel, Linseed tea, &c., until appetite returns. A few doses of the following are sometimes helpful :

Potassium Citrate . .	½ oz.
,, Acetate . .	½ ,,
Ether	¼ fl. oz.
Liquid Extract of Cinchona .	½ ,,
Warm Gruel . . .	½ pint

To be given night and morning.

PULMONARY MURRAIN

(Pleuro-Pneumonia Contagiosa ; Lung Disease)

See Contagious Diseases Act.

RED WATER

This disease commonly attacks milch cows, and has been stated to arise from the nature of the pasture. The cause, however, is obscure, and treatment is purely empirical.

TREATMENT may consist in giving saline aperients followed by digestive stimulants.

Aperient

Epsom Salt	¾ lb.
Barbadoes Aloes	1 oz.
Powdered Ginger	1 ,,
Ammonium Carbonate	½ ,,

Give in a quart of hot gruel.

Digestive Stimulant Drenches

1.

Powdered Gentian	1 oz.
Powdered Ginger	1 ,,
Sodium Bicarbonate	½ ,,
Spirit of Sal Volatile	1 fl. oz.

Give in a pint of water.

2.

Powdered Gentian	1 oz.
Powdered Cinchona	½ ,,
Powdered Caraway	1 ,,
Ammonium Carbonate	½ ,,

Give in a pint of water.

RETENTION OF THE PLACENTA

(Cleansing)

Retention of the placenta is not infrequent. But little force should be exerted in its removal. Copious injections of Chinosol (1 in 2,000) or Potassium Permanganate (1 in 1,000) should be employed. A gentle laxative, such as the following, may be given :

Liquid Extract of Ergot	½ fl. oz.
Oil of Juniper	1 fl. dr.
Linseed Oil	1 pint

After the placenta comes away, syringe again with Chinosol (1 in 2,000), Lysol (1 in 1,000), or Permanganate (1 in 1,000), and anoint the external generative organs with very soft Boric Acid Ointment.

Ordinary 'cleansing drenches' given immediately after calving are—

1. Liquid Extract of Cinchona . ½ fl. oz.
   Oil of Caraway . . . 30 min.
   Linseed Oil . . . ½ pint

2. Epsom Salt . . . ½ lb.
   Powdered Myrrh . . 1 oz.
   ,, Caraway . . 1 ,,
   ,, Gentian . . ¼ ,,

RINGWORM

1. Melted Lard . . . 2 lb.
   Oil of Turpentine . . 8 fl. oz.

   Mix, and when cool stir in very carefully—
   Oil of Vitriol . . . 2 fl. oz.
   Sulphur . . . . 8 oz.

   Stir until cold. Smear on the affected patches.

2. Carbolic Acid Ointment . 1 oz.
   Beta Naphthol . . . 30 gr.

THRUSH IN CALVES

(Aphthæ ; Stomatitis)

Occurs as whitish patches on the tongue and mouth of suckling calves.

Treatment.—Wash the mouth out with Boric Acid lotion (½ oz. to 1 pint water). Smear the tongue and gums with Glycerin of Borax. If neither of these is at hand, use Permanganate of Potash lotion of a light pink colour.

Internally.—Give a teaspoonful of Calcined Magnesia every day.

WOODEN TONGUE

(Actinomycosis)

A malignant contagious disease, communicable to man. In early stages Potassium Iodide in large doses is of service.

WORMS

Tapeworms are sometimes very difficult to dislodge, and if one remedy fails another should be tried.

1. Freshly ground Areca Nut . ¾ to 1 oz.
   Oil of Turpentine . . 2 fl. oz.
   Linseed Oil . . . ½ pint

2. Liquid Extract of Male Fern 3 to 4 fl. dr.

Give in ¼ pint of milk *after the beast has fasted for twelve hours.* Follow in twenty-four hours with—

Epsom Salt	¾ lb.
Barbadoes Aloes	1 oz.
Powdered Ginger	1 ,,
Gruel	1 pint

3. Santonin 1 dr.
Oil of Turpentine 2 fl. oz.
Ferrous Sulphate 40 gr.
Linseed Oil ½ pint

Directions as above.

DISEASES OF SHEEP

Owing to their numbers it is not easy to treat sheep individually in the same way as horses or cattle, collective treatment only being possible. Parasitic diseases are most common, and are usually treated by dipping. All pens, railings, gates, troughs, &c., must be disinfected with solution of Chlorinated Lime, Wood Creosote, Lysol, &c. Infected lands should be well drained, salted, and ploughed with lime. If possible, the grass should be burnt off.

Change of pasture is always beneficial. Tonics and condition powders, such as Salt, Gentian, Ferrous Sulphate, Fœnugreek, &c., may be mixed with food placed in troughs. It should be noted that cotton-cake acts as a nitrogenous poison to lambs. Mangolds in late spring cause urinary trouble among rams.

BOTS

(Grub in the Head)

Sheep that have been attacked by gadfly suffer from a discharge of the nostrils, sneezing, cough, diarrhœa, and general loss of condition. The most effectual treatment is to hold the animal's head over a pan containing burning Sulphur for a few moments. Repeat, if necessary, in two days. Smearing the sheep's head and nostrils with a mixture of Coal Tar, Stockholm Tar, and fish oil during the early summer acts as a preventive.

FLY

Attacks of ' fly ' (*Musca vomitoria*) are not difficult to prevent if the sheep are attended to in early summer before the eggs are laid or the grubs hatched. The simplest plan is to sprinkle a fly powder from a dredger, following a stick drawn through the wool. If this is not done the fly deposits its eggs, from which, after hatching, the maggots burrow under the skin, setting up inflammation and irritation. Patches of wool fall off, and the fleece is disfigured.

Fly Powder

1. Lead Carbonate . . . 2 lb.
   Red Lead . . . . ½ ,,
   Sulphur . . . . 1½ ,,
   Animal Oil (*Dippel's Oil*) . ¼ ,,

Mix thoroughly, and pass through a fine sieve.

2. Powdered White Hellebore . 1 lb.
   Lead Carbonate . . . 1 ,,
   Sulphur . . . . 2 ,,
   Animal Oil. . . . ¼ ,,

3. Lysol mixed with sufficient whiting to form a dry powder.

If the fly has 'struck,' the sores should be dressed with—

Sulphur Ointment . . 1 lb.
Wood Creosote . . 1 oz.

Mix. This is safer than Corrosive Sublimate, and does not injure the wool.

FOOT-ROT

Liquid Applications

1. Verdigris . . . . 3 oz.
   Copper Sulphate . . 6 ,,
   Acetic Acid . . . 6 fl. oz.
   Solution of Antimony Chloride 1½ ,,
   Water to produce . . 1 pint

   Boil for five minutes, or until dissolved.

2. Solution of Antimony Chloride,
   Glycerin . . . of each equal parts

GARGET. HOVEN

Sheep may be treated in the same manner as cattle, the dose of internal medicines being about one-fourth that for an ox.

GID. STURDY. TURNSICK.

These are names given to an affection characterised by giddiness, loss of cerebral function, &c., caused by the presence of hydatids in the brain. The eggs of a worm, *Tænia cœnurus*, dropped on pastures by dogs, are eaten with the grass by the sheep, and develop into bladder-worms in the brain. There is no known cure.

HEAVING, OR PARTURITION FEVER

(Septic Metritis)

Inflammation of the womb, induced by a specific organism. It is very contagious, and the greatest care should be taken in separating infected ewes, disinfecting pens, and burning litter, &c. Warm vaginal injections of Chinosol (1 in 1,500) or other antiseptics alone do any good. If the animal survives, give tonics and good, easily digested food.

HUSK

(Hoose)

Caused by a parasite—*Strongylus filaria*—in the air passages, and treated in a similar way to 'hoose' in calves. Shepherds generally give each animal one or two tablespoonfuls of Salt every day, but the treatment with Oil of Turpentine is more efficacious. Fumigation with Sulphur or Iodine is useful, and in bad cases intra-tracheal injections of Turpentine or Chloroform may be necessary. Lambs should not be pastured on lands that have been much grazed by sheep.

LIVER-ROT

(Flukes)

A destructive parasitic disease occasioned by the presence of flukes (*Distomum hepaticum*) in the bile duct. Flukes are commonly present in sheep, the cysts being eaten with grass, but they do not multiply if the flocks are pastured on dry, well-drained lands. Wet seasons and low-lying marshy pastures invariably predispose to an attack of flukes. Sheep on salt marshes do not suffer from the rot, and common Salt, given with the food or placed within access, is useful in destroying young flukes. Once the disease is established it is incurable, death generally supervening in six months.

Infected lands should be well salted and ploughed with lime. If the weather is very dry, the grass should be burnt off.

PARASITIC DIARRHŒA

This is sometimes called *the lamb disease*, and is due to the presence of a tapeworm, *Tænia expansa*, in the intestines. Vermifuges, as Oil of Turpentine or Oil of Male Fern, are indicated:

Liquid Extract of Male Fern	½–1 fl. dr.
Oil of Turpentine . .	1–2 ,,

Give in a little milk after a twelve-hours' fast. Follow up after a few hours with a dose of Castor or Linseed Oil.

SCAB

A highly contagious parasitic disease produced by the bites of acari which live on the serous fluid effused as a result of the irritation. In addition to rendering the flock owner liable to legal restriction, it damages the wool and causes great loss. Scab can only be eradicated by isolating the animals attacked, repeatedly dipping in antiparasitic dips, and removal to non-infected pastures.

The formulæ for the three following dips are recommended by the Board of Agriculture :

1. Flowers of Sulphur . . 25 lb.
   Quicklime . . . 12½ ,,
   Water . . . . 20 gals.

Boil and stir for half an hour, or until the liquid is of a dark-reddish colour. Cool, pour off the clear liquor, and make up to 100 gals. with water.

2. Soft Soap . . . . 5 lb.
   Liquefied Carbolic Acid, containing not less than 97 per cent. real Tar Acids . . 3 qts.

Dissolve by gentle heat, and pour into 100 gals. of water.

3. Tobacco Offal . . . 35 lb.
   Water . . . . 21 gals.

Steep for four days, stirring occasionally. Press out as much liquor as possible, add—

Sulphur . . . . 10 lb.

and sufficient water to make 100 gals. Keep well stirred. This dip must *not* be boiled.

Besides the above, arsenical and kerosene dips are very commonly employed, although less useful than the foregoing.

Arsenical Sheep Dip (Curtice)

White Arsenic . . . 1¼ lb.
Caustic Soda . . . 1¼ ,,
Soft Soap . . . . 4 ,,

Boil in a few gallons of water until dissolved, and make up to 50 gals. Sufficient for about fifty sheep.

Kerosene Sheep Dip (Curtice)

Soft Soap . . . . 1 lb.
Water . . . . 1 gal.

Dissolve by heat, cool, and add in a thin stream, whipping vigorously meanwhile—

Kerosene . . . . 2 gals.

Finally dilute with water to 27 or 28 gals.

In addition to the foregoing, Carbolic Ointment, Mercury Ointment, and Sulphur Ointment are used as applications for 'scab.' Mercury is dangerous, but both Carbolic and Sulphur, especially in combination with Tobacco, are excellent parasiticides.

SHEEP-POX

Variola ovina, or sheep-pox, is an eruptive infectious disease similar to small-pox in man. It is unknown in Great Britain at the present time. Recovered animals transmit infection for many weeks, but are themselves immune from any future attack. Infected buildings, &c., retain the poison for months, and can only be purified by the fumes of burning Sulphur or other stringent measures. In flocks already infected, inoculation cuts short the attack, otherwise mortality may be very high, especially in the confluent or malignant form.

See Contagious Diseases Act.

THRUSH

(Stomatitis)

May be treated as described for calves, or a little Saltpetre may be mixed with the food.

TICKS. FAGS. LICE

The louse (incorrectly called a *tick*), *Melophagus ovinus*, and the louse, *Trichodectes sphærocephalus*, are external parasites which cause intense irritation. They are killed by 'dipping,' especially if the liquid is warm. If not too numerous, they may be destroyed with Sulphur Ointment 8 parts, Wood Creosote 1 part. Mercury Ointment is an effectual parasiticide, but is dangerous unless applied in warm weather. Lysol is also an excellent remedy, especially mixed with Sulphur Ointment.

DISEASES OF SWINE

SWINE may be treated much in the same way as sheep or cattle, except in regard to the method of administration. They are proverbially obstinate, and any medicine should when possible be incorporated with their favourite food.

NOTE.—Common salt is poisonous to swine.

Doses: As swine vary so enormously in weight, it is somewhat difficult to give exact doses, but as a rule a full-grown hog will take as much medicine as a man, while young pigs will bear about the same doses as young children.

RHEUMATISM

(Joint Ill ; Joint Felon)

Pigs are difficult subjects to treat, but the swollen joints may be rubbed with a liniment—

Soap Liniment,
Compound Camphor Liniment . of each equal parts

Internally doses of either of the following may be added to a small portion of food twice a day :

Sodium Salicylate . .	10–20 gr.

or

Potassium Iodide . .	10–15 gr.
Powdered Colchicum Seeds	5–10 ,,

SWINE ERYSIPELAS

A contagious affection not very common in Great Britain. The mortality is high, and no known treatment is of any avail.

SWINE FEVER

(Pneumo-Enteritis ; Hog Cholera ; Purples ; Red Disease ; Soldier)

This disease, known as hog-cholera, pig-typhoid, is scheduled under the Contagious Diseases (Animals) Act, and owners should notify the police directly there is any suspicion of its presence. Treatment is useless. Sties, trucks, &c., are capable of infecting healthy animals for weeks, and the greatest precautions are necessary in disinfection.

DISEASES OF DOGS

CANKER OF THE EAR

Canker is generally caused by the burrowing of a parasitic mite. The so-called fits from which many cats suffer is often due to this parasite. A little warm Carbolic Oil (1 per cent.) poured into the meatus every day for four or five days, followed by careful cleaning with cotton wool tied to a stout feather, is generally sufficient. If the ear is ulcerated, it should be bathed with warm Boric Acid lotion (30 grains to a pint of water), dried, and dressed with Carbolised Oil (1 per cent.).

An even better treatment, because the symbiotes are rapidly destroyed, is to pour a little of the following into the meatus from a warmed teaspoon—

Nitrate of Mercury Ointment	1 dr.
Olive Oil	3 oz.

Mix together and apply warm.

CONSTIPATION

Aperients are only required when the animal postures for defæcation without result. Equal parts of Syrup of Buckthorn and Olive or Castor Oil is a common remedy. Small but frequent doses of Epsom Salt are better. In urgent cases powdered Jalap, 10 to 30 grains according to the weight of the animal, may be placed on the back of the tongue. Aloes is not recommended as a purgative.

An injection of half a pint of warm soapy water is very useful.

DISTEMPER

Over 60 per cent. of cases of canine distemper occur in dogs under one year old. In its most common form it may be described as an infectious catarrh of the eyes, respiratory and digestive organs, resembling measles. Inflammation of the lungs and other complications may supervene. The preliminary symptoms are depression, loss of appetite, sneezing, cough, discharge from the nostrils and eyes. Mild cases may recover in a week or so, but severe cases last three weeks or more. As a rule,

one attack confers immunity for life, but there are exceptions.

TREATMENT.—Isolate the animal; keep warm and out of draughts. Allow plenty of milk with soaked dog biscuit and a little finely chopped meat. Bathe the eyes and nostrils with Boric Acid lotion (30 grains to a pint of warm water) and smear the lids with soft boric ointment. In case inflammation of the lungs occurs, apply Mustard and Linseed poultices to the sides of the chest, or rub with Compound Camphor or Turpentine Liniment. Keep the bowels open with Epsom Salt. Should any skin trouble appear, apply Boric Ointment, alone or mixed with an equal weight of Zinc Ointment.

Gastric distemper is less common. The most successful treatment is a mixture of Bismuth Salicylate and Soda :

Bismuth Salicylate . .	5–15 gr.
Sodium Bicarbonate . .	5–15 ,,

To be placed on the back of the tongue twice a day.

The nervous form, in which the dog is subject to fits, is more difficult to treat. Small doses of Potassium Iodide, or Salicylate and Bicarbonate of Soda, do good. Bromides also are recommended. The following are the doses :

1. Potassium Iodide . .	2–8 gr.
2. Sodium Salicylate .	5–20 gr.
Sodium Bicarbonate .	5–15 ,,
3. Potassium Bromide .	5–20 gr.

In the convalescent stage stimulants and tonics are given, generally in the form of a large pill :

Quinine Sulphate . . .	$\frac{1}{8}$–$\frac{1}{2}$ gr.
Extract of Nux Vomica .	$\frac{1}{10}$–$\frac{1}{4}$ gr.

Starch and Extract of Gentian to form one pill.

To be given once a day.

ECZEMA

Eczema is known as red mange, blotch, surfeit, &c. It is a non-contagious affection caused by indigestion, improper feeding, &c. The first symptoms are feverishness and a reddening of the skin under the thighs and arms. This is followed by an eruption of vesicles which break and form scabs. It is often mistaken for mange, with which it has nothing in common.

TREATMENT.—Change the food and give only the simplest, and that in small quantity. Allow as much

fresh couch-grass as the dog will eat. The irritation may be allayed by bathing with—

1. Boric Acid . . . 20 gr.
   Chinosol . . . . 10 ,,
   Cherry Laurel Water . . 2 fl. oz.
   Water . . . . 1 pint

2. Borax . . . . 20 gr.
   Glycerin . . . . ½ fl. oz.
   Carbolic Acid . . . ¼ ,,
   Water . . . . 1 pint

Internally, mild aperients and salines should be administered :

Sodium Bicarbonate . . 5–10 gr.
Glauber's Salt . . . 20–40 ,,
Syrup of Buckthorn . . 15–60 min.
Water . . . . a sufficiency

Give twice a day.

Should the disease not yield to such simple treatment the following may be tried. Both are harmless should the dog lick the ointment off.

1. Zinc Ointment . . . 1 oz.
   Lead Acetate . . . 5 gr.
   Camphorated Oil . . 1 dr.

2. Boric Acid Ointment . . 1 oz.
   Chinosol . . . . 10 gr.
   Olive Oil . . . . 1 dr.

GASTRITIS

Gastritis is nearly always brought on by over-feeding, although it may result from the presence of irritants in the stomach. The treatment is the same as for man. Food should consist of milk and milk puddings. Plenty of *clean* water should be allowed.

1. Sodium Bicarbonate . . 8–20 gr.
   Bismuth Salicylate . . 5–15 ,,
   Dilute Prussic Acid . . 2–4 min.
   Tincture of Calumba . . 10–20 ,,
   Water . . . . a sufficiency

   A dose to be given three times a day.

2. Bismuth Carbonate . . 5–15 gr.
   Potassium Bromide . . 5–10 ,,
   Tincture of Cinchona . . 5–15 min.
   Tincture of Opium . . 2–10 ,,
   Water . . . . a sufficiency

JAUNDICE

The hairless parts of the body, the white of the eye, &c., will be found coloured yellow. A large dose of Calomel, 3–10 gr. (not repeated, as dogs are easily salivated) according to size, should be given, followed by a course of Epsom Salt.

MANGE

Sarcoptic mange, or scabies of the dog, is a parasitic affection caused by a mite, *Sarcoptes canis*, similar to the itch mite of man. It burrows under the skin and sets up intense irritation. It is very contagious, and once contracted spreads rapidly.

TREATMENT.—The dog should be thoroughly washed with plenty of soft soap and warm water. After drying, either of the following applications will eradicate the pest, the hair generally growing freely again. Two or three dressings at intervals of three days suffice.

Kennels, &c., must be thoroughly disinfected with Lysol and water.

1. Olive Oil
   Oil of Turpentine
   Oil of Tar
   } equal parts

2. Olive Oil . . . . 1 pint
   Lysol . . . . 1 oz.
   Sulphur . . . . 2 ,,

Follicular Mange is more difficult to cure. It is also caused by a parasite, *Demodex folliculorum*, burrowing into the hair follicles and sebaceous glands.

The hair should be clipped and the following application rubbed in thoroughly every other day for two or three weeks:

Creosote . . . . ½ oz.
Olive Oil . . . . 7 ,,
Sulphur . . . . 1 ,,
Solution of Potash . . 1 ,,

RABIES

See Contagious Diseases Act.

RHEUMATISM

Dogs are very subject to rheumatism, especially of the muscles—the so-called 'kennel lameness.' The stiff and painful parts should be gently rubbed with

Soap Liniment . . . 3 parts
Compound Camphor Liniment 1 part

Internally, doses of Sodium Salicylate 4–20 gr., or Potassium Bicarbonate 5–15 gr. with Colchicum Wine 3 to 8 drops, should be given twice a day.

WORMS

Tapeworms (*Tænia*) are very common in dogs, as well as *Ascaridæ* (round worms). Cats who are fond of fish are frequently subject to attacks of a worm known as *Bothriocephalus*. As it is not always known from which parasite the animal is suffering, many practitioners combine remedies. *One* of the following may be given in doses apportioned to the weight of the dog :

Freshly powdered Areca Nut	15–120 gr.
Santonin	1–5 ,,
Oil of Male Fern	10–30 min.
Calomel	2–10 gr.
Pelletierine Tannate	3–10 ,,
Oil of Turpentine	10–40 min.

For very small toy dogs even the minimum doses must be reduced.

Powders may be mixed with a little sugar or dried and powdered meat, and placed on the back of the tongue. Oil of Male Fern and Oil of Turpentine may be mixed with a little milk, or be given in a gelatin capsule. A combination which is frequently effective is

Calomel	1–5 gr.
Santonin	1–5 ,,
Pelletierine Tannate	3–8 ,,
Freshly powdered Areca	10–60 ,,

For a medium-sized fox terrier the doses would lie between those given. Vermifuges are of little use unless given on an empty stomach, and they may with advantage be followed by a dose of Epsom Salt or Olive Oil with Syrup of Buckthorn in a few hours. Repeat in a few days.

CATS

Generally speaking, cats may be said to suffer from the same diseases as dogs, and they may be treated in a similar manner, allowance being made for differences in weight. The doses given for dog medicines are apportioned for animals of the weight of a good-sized Irish or fox terrier; for cats these doses should be reduced by about one-half.

It may be remarked that cats, like dogs, are great sufferers from so-called ' canker of the ear,' worms, and mange. These all yield to the treatment prescribed for dogs.

POULTRY

GAPES

A parasitic disease caused by worms (*Sclerostoma syngamus*), which adhere to the mucous membrane of the trachea. Affected birds gape, stretch their necks, and have difficulty in breathing.

TREATMENT.—If the beak is opened and the tongue pulled forward by blunt forceps, some of the worms may often be seen. Sometimes they may be removed with a feather, but, in any case, a feather that has been dipped in a mixture of Oil of Turpentine 1 part and Olive Oil 2 parts, rotated in the air passage, kills and dislodges a good many. As the disease is exceedingly contagious, all removed worms, dead birds, &c., should be burnt. Staging and pens should be fumigated with burning Sulphur or washed with 5 per cent. Carbolic Acid lotion. The runs should be salted and limed.

ROUP

Roup, or **Avian Diphtheritis,** is a croupy inflammation of the mucous membrane of the mouth and air passages. Two forms are recognised—

1. **Bacterial Roup,** caused by a micro-organism and nearly always fatal. It is very contagious.

2. **Gregarinous Roup,** caused by a common form of protozoa known as *Gregarines.*

Affected birds snuffle, sneeze, and gape. A deposit like hoar-frost appears on the mucous membrane of the mouth and nostrils, and may extend. The deposit may be painted with 2 per cent. Carbolic Acid or Lysol in Glycerin. Fumigations of Tar or Creosote are beneficial, but it is often cheapest in the end to destroy the bird and burn the body.

Some poultry breeders give Chinosol in pills :

Chinosol	3 gr.
Quinine Sulphate . . .	3 ,,
Black Pepper . . .	3 ,,

This is for one pill for a full-sized fowl.

ADDITIONAL VETERINARY FORMULAS

For Horses

Alteratives.—A conventional term to denote remedies which alter the condition so gradually as not to interfere with the usual diet or work —in common language, purify the blood. Mercury, Arsenic, Antimony, and the Iodides are typical examples. Alterative medicines are often given when an animal is 'out of sorts' without being subject to any specific disease.

Alterative Ball for Horse

1. Barbadoes Aloes . . 30 gr.
   Powdered Resin . . ½ oz.
   Powdered Ginger . . ¼ ,,
   Sodium Bicarbonate . . 1 dr.
   Antimony Sulphide . ½ ,,
   Soap and Treacle to make one ball.

   To be given every other day.

2. Sulphur . . . . ½ oz.
   Sodium Bicarbonate . . . 1 dr.
   Powdered Guaiacum Resin . ¼ oz.
   Powdered Ginger . . ¼ ,,
   Oil of Aniseed . . . 20 drops
   Soap and Treacle to make one ball.

   To be given every other day.

3. Barbadoes Aloes. . . 1 dr.
   Tartarated Antimony . . 10 gr.
   Powdered Ginger . . ¼ oz.
   Powdered Gentian . . ¼ ,,
   Soft Soap and Treacle. . a sufficiency

   To be given every other day.

4. Barbadoes Aloes. . . 1 dr.
   Potassium Nitrate . . 2 ,,
   Powdered Resin . . 2 ,,
   Powdered Ginger . . 1 ,,
   Soft Soap . . . . a sufficiency

   To be given every other day.

Spring Alterative Powder

Powdered Sulphur	4 oz.
Powdered Black Antimony	½ ,,
Powdered Saltpetre	1 ,,
Powdered Ginger	1 ,,
Powdered Caraway	2 ,,
Powdered Fœnugreek	4 ,,

One or two tablespoonfuls to be added to the food once a day.

Condition Balls

1.	Ferrous Sulphate	20 gr.
	Powdered Nitre	60 ,,
	Powdered Sulphur	90 ,,
	Powdered Caraway	60 ,,
	Powdered Ginger	60 ,,
2.	Powdered Black Antimony	30 gr.
	Powdered Gentian	60 ,,
	Powdered Aloes	30 ,,
	Powdered Ginger	60 ,,
	Powdered Resin	60 ,,

Astringents.—Drugs which contract tissues, chiefly by coagulating albumin. *Internally* they are used in cases of diarrhœa and hæmorrhage—Catechu, Tannin, Ferric Chloride, Lead Acetate, Chalk, Alum, &c. *Externally*, in the form of lotions or ointments, they reduce congestion of mucous surfaces and assist in the healing of wounds, ulcers, checking hæmorrhage, &c. *See* DIARRHŒA.

Astringent Balls

(If desired the same ingredients may be given as a *draught*).

1.	Powdered Opium	30 gr.
	Powdered Catechu	120 ,,
	Bismuth Carbonate	60 ,,
D.D.A.	Powdered Ginger	60 ,,
2.	Powdered Catechu	2 dr.
	Powdered Opium	30 gr.
	Powdered Ginger	60 ,,
D.D.A.	Oil of Caraway	15 drops

Cordials.—Combinations of stimulating and carminative medicines are given for exhaustion after over-exertion, as hunting, racing, &c., and as a stimulant to weak-stomached animals.

Cordial Balls

1. Camphor . . . . 20 gr.
   Powdered Digitalis . . 40 ,,
   Ammonium Carbonate . ½ oz.
   Powdered Ginger . . ¼ ,,
   Powdered Aniseed . . ¼ ,,
   Treacle and Soap sufficient for one ball.

2. Powdered Caraway,
   Powdered Ginger,
   Powdered Gentian,
   Powdered Cardamoms,
   Powdered Grains of Paradise,
   Ammonium Carbonate
   of each 1 dr.
   Treacle and Soap sufficient for one ball.

3. Powdered Ginger . . ½ oz.
   Powdered Caraway . . ¼ ,,
   Powdered Cardamoms . ¼ ,,
   Powdered Digitalis . . 1 dr.
   Quinine Sulphate . . 30 gr.
   Treacle and Soap sufficient for one ball.

Cordial Powder

Powdered Caraway . . 1 oz.
Powdered Ginger . . 1 ,,
Powdered Cardamoms . 1 ,,
Powdered Cinchona . . 1 ,,
Powdered Fœnugreek . 4 ,,

A tablespoonful or two to be mixed with the food given immediately after returning from heavy exercise.

Diuretics are agents which increase the secretion of the kidneys. Cold water in large quantity is a diuretic. Cardiac and vascular tonics, such as Digitalis and Squill, produce diuresis by raising the general blood pressure, while Nitrates act by dilating the renal vessels. Volatile oils, such as Juniper, Turpentine, &c., stimulate the kidney cells to increased action ; in large doses they may set up inflammation.

Diuretic Balls

1. Potassium Nitrate . . ½ oz.
   Powdered Digitalis . . 30 gr.
   Powdered Ginger . . ½ oz.
   Oil of Juniper . . . 20 min.
   Soap and Treacle sufficient for one ball.

2. Potassium Nitrate . . 1 dr.
Potassium Acetate . . 1 ,,
Sulphur . . . . ¼ oz.
Powdered Resin . . ½ ,,
Soap and Treacle sufficient for one ball.

3. Powdered Squill . . 30 gr.
Powdered Soap . . . ¼ oz.
Powdered Resin . . . ¼ ,,
Powdered Ginger . . ¼ ,,
Treacle to make one ball.

Febrifuges.—Medicines for reducing fevers are sometimes spoken of as febrifuges. The so-called 'fever ball' is occasionally of service when the horse is suffering from a slight cold and is feverish.

Fever Ball

Ammonium Carbonate. . 1 dr.
Potassium Nitrate . . 1 ,,
Potassium Citrate . . 1 ,,
Powdered Camphor . . 30 gr.
Oil of Caraway . . 20 drops
Powdered Gentian . . ¼ oz.
Treacle and Soap for one ball.

For other fever balls, *see* PNEUMONIA and other specific diseases.

Stock Cold and Fever Draught for Horses, Cattle, and Sheep

Spirit of Sal Volatile . . 5 fl. oz.
Sweet Spirit of Nitre . . 5 ,,
Oil of Peppermint . . ½ ,,
Essence of Ginger . . 2 ,,
Oil of Turpentine . . 3 ,,
Spirit of Camphor . . 3 ,,

Dose.—Horses and cattle, two to four tablespoonfuls in warm gruel; sheep, one tablespoonful in gruel.

Tonics are therapeutic agents which increase the vigour generally or the activity of one organ, producing a more lasting effect than simple stimulants. They are given in diseases attended with general debility, and to restore strength after an illness. *General Tonics* are Nux Vomica, Quinine, Iron, Gentian, Calumba, and the vegetable bitters; *Cardiac Tonics* are Digitalis and Strophanthus; Iron and Arsenic are *Blood Tonics*; Nux Vomica and Squill are *Vascular Tonics*; Acids, Calumba,

Gentian, &c., are *Gastric Tonics*; while Strychnine and Cinchona preparations act as *Nervine Tonics.*

Tonic Balls

1. Powdered Cinchona . . ½ oz.
   Powdered Ginger . . ¼ ,,
   Powdered Quassia . . 1 dr.
   Oil of Caraway . . . 20 drops
   Treacle and Soap to form one ball.

2. Quinine Sulphate . . 1 dr.
   Ferrous Sulphate . . ¼ oz.
   Powdered Aloes . . . 20 gr.
   Powdered Myrrh . . 1 dr.
   Powdered Ginger . . ¼ oz.
   Treacle and Soap to form one ball.

3. Powdered Gentian,
   Powdered Chamomile,
   Powdered Quassia,
   Powdered Ginger . of each ¼ oz.
   Treacle and Soap for one ball.

4. Powdered Gentian,
   Powdered Quassia,
   Powdered Cinchona,
   Powdered Myrrh . of each ¼ oz.
   Treacle and Soap sufficient for one ball.

5. Carbonate of Iron . . 1 dr.
   Potassium Carbonate . . 1 ,,
   Powdered Ginger . . ¼ oz.
   Powdered Aniseed . . ¼ ,,
   Treacle and Soap sufficient for one ball.

6. Powdered Aniseed . . ½ oz.
   Powdered Gentian . . ¼ ,,
   Powdered Aloes . . . 1 dr.
   Powdered Nux Vomica . 30 gr.
   Oil of Caraway . . . 20 drops
   Treacle and Soap for one ball.

7. Ferrous Sulphate . . 1 dr.
   Powdered Aniseed . . ½ oz.
   Quinine Sulphate . . 30 gr.
   Powdered Chamomile . . ¼ oz.
   Oil of Clove . . . 20 drops
   Treacle and Soap for one ball.

Tonic Powder

Powdered Gentian	1	oz.
Powdered Quassia	1	,,
Powdered Nux Vomica	¼	,,
Powdered Fœnugreek	1	lb.
Powdered Aniseed	2	oz.
Carbonate of Iron	1	,,
Common Salt	1	,,

A tablespoonful to be added to the food once a day.

Cattle Spice

Linseed Cake	28	lb.
Salt	10	,,
Locust Meal	56	,,
Decorticated Cotton Cake	28	,,
Gentian, Aniseed, Cumin Seed, Fœnugreek, Caraway Seed, Turmeric	of each 1	lb.

Grind the ingredients separately and mix well. Keep for seven days, occasionally turning over, by which time the whole should have turned a rich yellow colour.

PART II

DOMESTIC FORMULARY

BEVERAGES

Lithia Water, Aerated

1. Introduce into each half-pint bottle—

Lithium Carbonate	5 gr.

This dissolves in the Carbonic Acid.

2. Make a solution containing 10 grains of Lithium Citrate per pint, and bottle in the usual way.

The result to the patient is the same, whether carbonate or citrate is employed, as in the system the latter is converted into carbonate.

Seltzer Water, Aerated

1.

Fused Calcium Chloride	1¼ oz.
Magnesium Chloride	2½ ,,
Sodium Chloride	2 ,,

Dissolve in cold water and add—

Sodium Bicarbonate	3 oz.
Distilled Water to make	20 gals.

2.

Sodium Chloride	5 oz.
Sodium Bicarbonate	4 ,,
Sodium Phosphate	¼ ,,
Water	20 gals.

Potash Water, Aerated

Each half-pint bottle should contain 5 grains of Potassium Bicarbonate. This is about as much as is pleasant.

Soda Water, Aerated

Many makers sell plain aerated water as soda water, although in the opinion of analysts the practice is to be condemned. At any rate, 3 grains of Sodium Bicarbonate is not disagreeable, especially if combined with about 1 grain of Sodium Chloride in each half-pint.

Ginger Ale Syrup

Sugar	6 lb.
Water to produce	1 gal.

Dissolve and add—

Tartaric Acid	1½ oz.
Soluble Essence of Ginger	1½ fl. oz.
Soluble Essence of Lemon	30 min.
Colouring to taste.	

About 1 fl. oz. to each half-pint bottle.

Lemonade Syrup

1.

Sugar	10 lb.
Water	1 gal.

Dissolve and add when cool—

Citric Acid	5 oz.
Terpeneless Oil of Lemon	1 fl. dr.

Mix well and stand all night. Filter bright through a jelly-bag. About 1 oz. to half-pint bottle.

2.

Sugar	8 lb.
Citric Acid	3 oz.
Soluble Essence of Lemon	1½ fl. oz.
Water to	1 gal.

About 1 oz. to half-pint bottle, or 3½ oz. to a syphon.

3.

Sugar	12 lb.
Tartaric Acid	5 oz.
Oil of Lemon	1 fl. oz.
Water	1½ gal.

Add the lemon while syrup is warm. Stir well and allow to stand for the excess of oil to float. Draw off the clear syrup by means of a tap.

Rule for finding the volume of syrup produced by dissolving a given weight of sugar in a given volume of water.

Multiply the weight of sugar in pounds by 8 ; multiply the gallons of water by 130. Add the products together and divide by 130. The quotient is the answer required in gallons.

Example :

Sugar	65 lb.
Water	6½ gals.

$$65 \times 8 = 520$$
$$6{\cdot}5 \times 130 = 845$$
$$1{,}365$$

Then $1{,}365 \div 130 = 10{\cdot}5$ gals. of syrup.

Rule for finding the weight of sugar in 1 gallon of simple syrup by means of Twaddell's hydrometer.

Multiply degrees T. by 0·13.

Example.—The hydrometer floats at 50° T.

$50 \times 0{\cdot}13 = 6.5$ lb. of sugar in each gallon.

Yield of Gas from Whiting and Acid.

1 gal. Sulphuric Acid 22 lb. Good dry Whiting 4½–5 gals. Water	Yield about 65 cubic feet of gas, sufficient for about 210 syphons.

Preservative for Aerated Waters

A Departmental Committee on Food Preservatives recommended that Salicylic alone be recognised, and that in not larger quantity than 1 grain per Imperial pint.

Soluble Essence of Lemon

1. Peel lemons as thinly as possible. To each pound of such peel add 15 fl. oz. of Rectified Spirit. Stand for at least twenty-eight days. Press. To each pint add Terpeneless Oil of Lemon 2 fl. dr.

2. Oil of Lemon, Terpeneless . . ½ fl. oz.
   Rectified Spirit . . . . 2 pints
   Lemon Yellow Colour . . to tint

Soluble Essence of Ginger

Jamaica Ginger . . . 7 parts
African Ginger . . . 1 part

Exhaust the coarsely powdered rhizomes with 90 per cent. Alcohol. Dilute this strong essence with milk of lime (slaked lime 1 oz., water 1 pint), stirring constantly as long as any colour is removed. Filter immediately. Wash the filter with proof Spirit until about double the original volume has been obtained.

Next add, very cautiously, Dilute Sulphuric Acid until the dark colour just disappears. Dilute with an equal quantity of water and stand in an ice chamber for twenty-four hours. Filter bright by means of Kieselguhr.

The above is a modification of Thresh's method. Barium Hydroxide and Strontium Hydroxide seem to yield better results in the hands of some workers than Calcium Hydroxide.

Fermented Ginger Beer

1. Make an infusion of 1 lb. of bruised Ginger in 10 gallons of boiling water. Stand until cold. Stir occasionally. Allow to settle.

Dissolve 9½ lb. Sugar in the bright liquor run off from the above. Add 1½ oz. Citric Acid powder. Stir until dissolved.

Add half a pint of fresh brewer's yeast or 1 oz. of German yeast softened in water. Mix. Cover the tub loosely and allow to ferment for thirty-six hours or so.

Run off the clear liquor through flannel, and bottle.

NOTE.—All tubs and vessels must be thoroughly scalded or washed with Bisulphite solution, to kill moulds.

2. Jamaica Ginger, bruised	1 lb.
Cane Sugar	10½ ,,
Honey	¾ ,,
Cream of Tartar	2 oz.
Tartaric Acid	1 ,,
Rind and Juice of two Lemons	
Brewer's Yeast	½ pint
Water . to produce	12 gal.

Place the ginger in a coarse bag and simmer gently with 2 gals. water for half an hour. Pour the liquor on to the Cream of Tartar, Tartaric Acid and the lemon peel. Repeat the process a further three times with the same quantity of water. Dissolve in the mixed liquors the sugar and honey. Add the lemon juice and make up to 12 gals. Place in a suitable vessel, and when the temperature reaches 84° F. add the yeast. Stir well and leave about forty-eight hours to ferment. Skim off the yeast and strain the clear liquor into bottles. It should be in good condition in a few days.

White Spruce Beer

Jamaica Ginger, bruised	6 oz.
Cane Sugar	10 lb.
Honey	1 ,,
Cream of Tartar	1½ oz.
Essence of Spruce	5 ,,
Brewer's Yeast	½ pint
Water . to produce	10 gals.

Proceed as for ginger beer, adding the Essence of Spruce just before the yeast.

Home-brewed Ale

Ground Malt	1 peck
Hops	1 lb.
Water	20 gals.

Macerate for two hours, at 110° F., strain through a sieve and allow the liquor (wort) to cool to 70° F. Add:

Molasses	28 lb.

When dissolved, stir in a pint of fresh yeast, or half a pound of baker's yeast, previously softened in water.

Put the liquor into a 36-gal. barrel and fill up to within 6 in. of the bung-hole with tepid water. Bung tightly and roll the barrel to ensure admixture. Loosen the bung slightly so that gas may escape. It should be fit to drink in a fortnight.

A brewing licence is necessary in Great Britain.

Artificial Koumiss

1. Introduce into a champagne bottle 1 oz. of white sugar, and fill up to within an inch of the cork with fresh milk. Add good compressed yeast the size of two peas. Cork and wire down. Shake occasionally during twenty-four hours. Place in a cool cellar and allow to rest for five days.

From and after the fifth to the fourteenth day the mixture is fit for drinking. It should be of the consistence of thin cream, of a slightly acidulous and vinous odour ; it should not be lumpy or taste like buttermilk.

When first drunk this Koumiss causes slight diarrhœa, but the effect soon passes off.

2.

Separated or Skimmed Milk .	1 gal.
Water	1 quart
Cane Sugar	3¼ oz.
Milk Sugar	4 ,,

Dissolve the cane sugar in 1 pint of the water, and mix with half the milk. To this add a little yeast, previously softened with water. Stir and stand in a loosely covered vessel for six hours, at a temperature of about 80° F.

Dissolve the milk sugar in the rest of the water, mix with the reserve milk, and incorporate with the fermenting liquor. Strain through flannel, and bottle in champagne bottles. Wire the corks. If kept in a cool cellar it will take a week to ripen, but if kept at a temperature of about 70° F. it is ready for drinking in three or four days. After ten days it becomes unpleasant.

Heading for Aerated Beverages

Liquid Extract of Quillaia (1 lb. in a pint of 20 per cent. Alcohol), is generally employed. Where the brown colour is a drawback it may be removed by filtering through animal charcoal, or partially purified Saponin may be substituted.

For *Ginger Beer* Gum Arabic powder is often added to the brew in the proportion of ¼ oz. to a gallon.

Lemon Kali. Sherbet

Tartaric Acid, *dried*	8 oz.
Sodium Bicarbonate, *dried*	6 ,,
Sugar, *dried*	3 lb.
Oil of Lemon	2 dr.

Cheaper or dearer powders are obtained by increasing or reducing the proportion of sugar.

The Oil of Lemon must be uniformly distributed through a portion of the sugar before mixing with the bulk.

Lemonade Crystals

Tartaric Acid in *small* crystals, practically free from powder	1 lb.
Terpeneless Oil of Lemon	30 min.
Pure Aniline Yellow	2 gr.
Rectified Spirit	1 fl. dr.

Dissolve the dye in the spirit, add the lemon, and mix uniformly with the crystals.

Directions.—Half an ounce of the above, with 1 quart of water and 1 lb. of sugar, makes very palatable lemonade.

Ginger Beer Powder

Jamaica Ginger in 20 powder	1 lb.
Cream of Tartar	½ ,,
Tartaric Acid	3 oz.
Sugar	6 oz.
Oil of Lemon	2 fl. dr.

Put up in 3-oz. packets.

General Directions.—Add the powder to 2 gals. of warm water, stir well, and add sugar 2 lb.; when the temperature is about 100° F. add a wineglassful of brewer's yeast, or ½ oz. of German yeast previously softened with a little cold water. Allow to work all night, skim off most of the floating matter, settle for a day, and bottle.

The above formula closely approximates to one of the most popular powders on the market. Some contain about 5 per cent. of starch powder, but no particular advantage seems to attach to its use.

Ginger Wine Essence

1. Tartaric Acid		4 oz.
Tincture of Capsicum		2 fl. dr.
Strong Tincture of Ginger		2½ fl. oz.
Caramel B.		a sufficiency.
Water	to	1 pint

2. Tartaric Acid	. . .	4 oz.
Capsicin	. . .	6 gr.
Strong Tincture of Ginger	.	2½ fl. oz.
Soluble Essence of Lemon	.	1 fl. dr.
Burnt Sugar	. . .	a sufficiency
Water	. . to	1 pint

Four fluid ounces of Ginger Wine Essence with 2 lb. of sugar will make 2 quarts of ginger wine ready for use.

Herb Beer Extract

Extract of Liquorice	.	8 oz.
,, Dandelion	.	4 ,,
,, Gentian	. .	2 ,,
,, Chamomile	.	2 ,,

Dissolve in 2 pints of boiling water; when nearly cool add—

Concentrated Decoction of Sarsaparilla (1 to 7)	.	10 fl. oz.
Essence of Ginger	. .	1 ,,
Tincture of Cinnamon	.	2 ,,
Glucose	. . .	5 lb.
Burnt Sugar	. . .	½ ,,
Salicylic Acid	. .	120 gr.
Chloroform	. .	25 min.
Oil of Hop	. .	20 ,,
Fresh Infusion of Hop (4 oz. to 1 pint) to		1 gal.

Macerate for seven days, shaking occasionally, and filter bright through a jelly-bag.

Directions.—Add four tablespoonfuls of the extract to 2 gals. of warm water, stir well, and add sugar 2 lb.; when the temperature is about 100° F. add a wineglassful of brewer's yeast, or ½ oz. of German yeast previously softened with a little cold water. Allow to work all night, skim off most of the floating matter, settle for a day, and bottle.

WINES

Orange Wine (from Dried Peel)

Sultanas	. . .	12 lb.
Cane Sugar	. .	18 ,,
Honey	. . .	¼ ,,
Cream of Tartar	. .	2 oz.
Dried Bitter Orange Peel	.	1¼ lb.
Water	. to produce	9 gals.

Bruise the raisins, add the broken orange peel and 2 gals. of boiling water. Stir frequently during three hours. Strain off the liquor. Repeat the extraction

with a further two lots of boiling water. Dissolve the Sugar, Honey and Cream of Tartar in the mixed liquors. Strain into a 9-gal. cask, make up with water and allow to ferment. If the temperature of the room is kept about 70° F. fermentation should be complete in from four to six weeks. Run the clear wine into a clean cask, add two or three sheets of gelatin, previously softened in water, bung securely and leave to mature.

Orange Wine (from Fresh Fruit)

Sultanas	12 lb.
Cane Sugar	18 ,,
Rind of Seville Oranges	25
Orange Juice	1 quart
Honey	¼ lb.
Water	to produce 9 gals.

Proceed as before, extracting the fresh orange peel with the raisins, and adding the orange juice just before making up.

Sherry Type

Proceed as for Orange Wine (from Dried Peel) but omit the orange peel. When the fermentation is nearly complete add to a 9-gal. cask the following :

Essence of Vanilla	1½ fl. dr.
Tincture of Orris Root	1 ,,
Essential Oil of Bitter Almonds	10 min.
Infusion of Sweet Briar Leaves (1 in 20)	2 fl. oz.
Orange Flower Water	2 ,,

Elderberry Wine

Sultanas	12 lb.
Cane Sugar	18 ,,
Fresh Elderberry Juice	½ gal.
Honey	¼ lb.
Cream of Tartar	2 oz.
Burnt Sugar	¼ lb.
Water	to produce 9 gal.

Proceed as for Orange Wine, adding the Elderberry juice just before making up.

Damson Wine

Damsons	10 gals.
Water, boiling	10 ,,

Stir several times daily for four days. Then add :

Cane Sugar	40 lb.

Dissolve the sugar and place the whole in a cask. Cover bung hole with a cloth while fermenting. Then bung tightly, and stand twelve months.

Cowslip Wine

Cane Sugar	24 lb.
Rind and Juice of Lemons	10
Rind and Juice of Seville Oranges	10
Cowslip Pips, fresh	4 gals.
Water	8 ,,

Dissolve the sugar in the water, bring to boil, add the juices and pour whole on to the peel. When about blood heat add the cowslip pips. Add three tablespoonfuls of brewer's yeast. Ferment for seven to ten days. Put in cask ; stand two months and bottle.

Prune Wine

Sultanas	9 lb.
Prunes	14 ,,
Cane Sugar	14 ,,
Cream of Tartar	2 oz.
Water . to produce	9 gals.

Proceed as for Orange Wine, first stoning the prunes.

Ginger Wine

Sultanas	12 lb.
Cane Sugar	18 ,,
Honey	¾ ,,
Jamaica Ginger, bruised	1 ,,
Cream of Tartar	2 oz.
Rind and Juice of two Lemons	
Water . to produce	9 gals.

Proceed as for Orange Wine, macerating the ginger with the raisins.

BITTERS

Angostura

1.	Angostura Bark	3 oz.
	Cardamoms	1 dr.
	Ginger	½ ,,
	Cinnamon	½ ,,
	Coriander	½ ,,
	Lemon Peel	1 oz.
	Orange Peel	1 ,,
	Raisins	¾ lb.
	Proof Spirit to	1 gal.

Macerate the well-bruised ingredients for at least fourteen days, press, and filter.

2. Angostura Bark . . . 3 oz.
Gentian Root . . . 1½ ,,
Cinnamon,
Cloves,
Caraway . . of each 60 gr.
Orange Peel . . . 2 oz.
Cardamoms . . . ¼ ,,
Raisins . . . . 1½ lb.
Brandy . . . . 2 pints
Proof Spirit to . . . 1 gal.

Macerate, &c., as above.

Orange

Fresh Bitter Orange Peel . 12 oz.
Fresh Lemon Peel . . 8 ,,
Cascarilla . . . . 2 ,,
Gentian . . . . 1 ,,
Cardamoms . . . 1 dr.
Proof Spirit to . . 1 gal.

2. Soluble Oil of Bitter Orange Peel . . . ½ fl. oz.
Soluble Oil of Lemon . . ½ ,,
Tincture of Angostura Bark. 1 oz.
Concentrated Infusion of Gentian to . . 1 pint

3. Orange Wine . . . 8 gals.
Dry Bitter Orange Peel . 3 lb.
Peel of Fresh Lemons . . 2
Rectified Spirit . . . 1 gal.
Water . . . . 1 ,,

Exhaust the peels by percolation, first with the spirit, then with the water. Mix the percolate with the orange wine.

LIQUEURS, Etc.

In the manufacture of liqueurs, the greatest attention must be paid to blending the flavours. Consequently the formulas are apparently very complicated. The age of a liqueur is also another important factor—it improves with every additional day, not to say year.

Benedictine

Cloves . . . . 100 gr.
Mace . . . . 100 ,,
Nutmeg . . . . 100 ,,
Sage, fresh . . . 20 ,,
Mint, fresh . . . 20 ,,
Coriander . . . . 120 ,,
Angelica Seeds . . . 120 ,,
Caraway . . . . 120 ,,
Fresh Lemon Peel . . 10 oz.
Cinnamon . . . 1¼ ,,

Cassia	200 gr.
Vanilla	1¼ oz.
Saffron	160 gr.
Tincture of Orange Peel	20 fl. oz.
Essential Oil of Almonds	200 min.
Rum	1 pint
Brandy	4 pints
Rectified Spirit	6 ,,
Distilled Water	4 ,,

Macerate for twenty-eight days, press and filter, and add—

Simple Syrup	1½ gal.

Peppermint

1. | | |
|---|---|
| Oil of Peppermint | 1 fl. dr. |
| Rectified Spirit | 15 fl. oz. |
| Distilled Water | 25 ,, |
| Chlorophyll | a sufficiency to impart a pale-green tint. |

Mix, filter bright through Kieselguhr, and add—

Best Cane Sugar	13 oz.

Keep for some months before use.

2. | | |
|---|---|
| Oil of Peppermint | 30 min. |
| Fresh Mint Leaves | ½ oz. |
| Rectified Spirit | 1¼ pints |
| Sugar | ½ lb. |
| Water | to 2 pints |

Mix the oil, spirit and mint leaves. Macerate for three days. Filter, add the sugar and water. Dissolve.

Curaçoa

Essential Oil of Almond	2 min.
Oil of Cinnamon	2 ,,
Tincture of Orange	5 fl. oz.
Tincture of Lemon	1 ,,
Syrup of Orange Flower	5 ,,
Brazil Wood	24 gr.
Brandy	14 fl. oz.

Kummel

Oil of Caraway	240 min.
Oil of Lemon, Oil of Bitter Orange, Oil of Coriander, Oil of Clove	of each 3 min.
Cardamoms	20 gr.
Brandy	1 pint
Sugar	3 lb.
Proof Spirit to	1 gal.

Cherry Brandy

Mash ripe Morella cherries, press out the juice. To each gallon add—

Brandy	¾ gal.
Lemon Peel	4 oz.
Cinnamon	1 dr.
Pimento	1 ,,
Coriander	1 ,,
Essential Oil of Almond	5 min.
Essence of Vanilla	10 ,,
Rectified Spirit	1 qt.

Keep for six months before straining. Afterwards keep for another six months before use.

Sloe Gin

Sloes, pricked	5 lb.
Sugar	6 ,,
Cinnamon	1 oz.
Cloves	20 grains
Essence of Peach Kernel	2 fl. dr.
Unsweetened Gin	1 gal.

Macerate the sloes, cinnamon and cloves in the gin for one month, strain off the liquor, add the remaining ingredients, stir until the sugar is dissolved. Strain and bottle.

Ginger Brandy

Finest Essence of Jamaica Ginger (Tr. Zingib. Fort., B.P. 1885)	8 fl. oz.
Oil of Lemon	10 drops
Brandy	1 gal.
Simple Syrup	½ ,,

Mix. Keep for several months before use.

COCKTAILS AND CUPS

Manhattan

Vermouth	½ wineglassful
Whisky	½ ,, ,,
Simple Syrup	30 drops
Angostura Bitters	10 ,,
Curaçoa	6 ,,
Crushed Ice	a little
Lemon Peel	1 strip

Martini

Unsweetened Gin	½ wineglassful
Vermouth	½ ,, ,,
Simple Syrup	6 drops
Orange Bitters	12 ,,
Crushed Ice	½ tumblerful
Lemon Peel	1 strip

Gin

Unsweetened Gin	1 wineglassful
Simple Syrup	10 drops
Orange Bitters	10 ,,
Crushed Ice	½ tumblerful
Lemon Peel	1 strip

Sloe Gin

Sloe Gin	½ wineglassful
Unsweetened Gin	½ ,, ,,
Orange Bitters	10 drops
Crushed Ice	½ tumblerful
Lemon Peel	1 strip

Whisky

Whisky	1 wineglassful
Simple Syrup	15 drops
Angostura Bitters	10 ,,
Crushed Ice	½ tumblerful
Lemon Peel	1 strip

Brandy

Brandy, French	1 wineglassful
Simple Syrup	15 drops
Angostura Bitters	10 ,,
Crushed Ice	½ tumblerful
Lemon Peel	1 strip

Cider Cup

Cider, Iced	1 bottle
Soda Water, Iced	1 ,,
Brandy	1 liqueurglassful
Cucumber, Lemon Rind	a few thin strips
Lemon Juice	1 dessertspoonful
Castor Sugar	to taste

Claret Cup

Claret	1 bottle
Soda Water	1 bottle
Iced Water	½ tumblerful
Ice, in lumps	a sufficiency
Sugar	to taste
Borage	few sprigs
Lemon, Sliced	half
Banana, Sliced	one
Cucumber	few thin slices

ARTIFICIAL FRUIT ESSENCES

NOTE.—Artificial fruit essences are never satisfactory. They may be improved by the addition of concentrated fruit juice.

Take ripe fruit, mash and press through a hair sieve. To every pound of juice add half a pint of Rectified Spirit. Mix, allow to stand for a week and filter.

(*Liquids in parts by volume*)

Essence of Apple

Aldehyde	2 parts
Chloroform	1 part
Acetic Ether	1 ,,
Nitrous Ether	1 ,,
Oxalic Acid	1 ,,
Glycerin	4 parts
Amyl-Valerianic Ether	10 ,,

Essence of Pear

Acetic Ether	5 parts
Amyl-Acetic Ether	2 ,,
Glycerin	2 ,,

Essence of Cherry

Benzoic Ether	5 parts
Acetic Ether	5 ,,
Œnanthic Ether	1 part
Benzoic Acid	1 ,,
Glycerin	3 parts

Essence of Black Cherry

Benzoic Ether	5 parts
Acetic Ether	10 ,,
Oil of Peach Kernel	2 ,,
Benzoic Acid	2 ,,
Oxalic Acid	1 part

Essence of Apricot

Butyric Ether	10 parts
Valerianic Ether	5 ,,
Glycerin	4 ,,
Amylic Alcohol	2 ,,
Amyl-Butyric Ether	1 part
Œnanthic Ether	1 ,,
Chloroform	1 ,,
Tartaric Acid	1 ,,

Essence of Peach

Formic Ether	5 parts
Valerianic Ether	5 ,,
Butyric Ether	5 ,,
Acetic Ether	5 ,,
Glycerin	5 ,,
Oil of Peach Kernel	5 ,,
Aldehyde	2 ,,
Amylic Alcohol	2 ,,
Sebacylic Ether	1 part

Essence of Strawberry

Butyric Ether	5 parts
Acetic Ether	5 ,,
Amyl-Acetic Ether	3 ,,
Amyl-Butyric Ether	2 ,,
Glycerin	2 ,,
Formic Ether	1 part
Nitrous Ether	1 ,,
Methyl-Salicylic Ether	1 ,,

Essence of Raspberry

Acetic Ether	5 parts
Tartaric Acid	5 ,,
Glycerin	4 ,,
Aldehyde,	
Formic Ether,	
Benzoic Ether,	
Butyric Ether,	
Amyl-Butyric Ether,	
Acetic Ether,	
Œnanthic Ether,	
Methyl-Salicylic Ether,	
Nitrous Ether,	
Sebacylic Ether,	
Succinic Acid of each	1 part

Essence of Pineapple

Amyl-Butyric Ether	10 parts
Butyric Ether	5 ,,
Glycerin	3 ,,
Aldehyde	1 part
Chloroform	1 ,,

Essence of Banana

Butyric Ether	1 part
Amyl-Acetic Ether	1 ,,
Alcohol	1 ,,

Essence of Blackberry

Acetic Ether	30 parts
Butyric Ether	60 ,,
Vanillin	1 part
Essence of Orris	500 parts

Essence of Plum

Acetic Ether	5 parts
Aldehyde	5 ,,
Oil of Peach Kernel	4 ,,
Butyric Ether	2 ,,
Formic Ether	1 part
Glycerin	8 parts

Essence of Currant

Acetic Ether	5 parts
Tartaric Acid	5 ,,
Benzoic Acid	1 part
Succinic Acid	1 ,,
Benzoic Ether	1 ,,
Aldehyde	1 ,,
Œnanthic Acid	1 ,,

ESSENCES, CULINARY

Essence of Vanilla

Vanilla	3 oz.
Musk	1 gr.
Rectified Spirit	1 pint

Beat the Vanilla to a paste, work in 3 oz. well-washed sand, add the spirit, and macerate for twenty-eight days shaking occasionally. Strain off the clear essence, and reserve the marc until sufficient has collected to be worth while working up.

The trace of Musk greatly improves the flavour and bouquet.

Essence of Cucumber

Cucumbers, well bruised	24 lb.
Rectified Spirit	3 pints

Distil 4 pints. *Small, ill-shaped Cucumbers can generally be bought very cheaply.*

Essence of Celery

Celery Seeds *ground very finely*	5 oz.
Rectified Spirit to	1 pint

Essence of Peach Kernel

Essential Oil of Almond	25 min.
Essence of Musk	3 ,,
Coumarin	1 gr.
Essence of Vanilla (3 in 20) to	1 pint

Essence of Almond

Essential Oil of Almond, free from Prussic Acid	6 dr.
Coumarin	1 gr.
Rectified Spirit to	8 fl. oz.

Essence of Rennet

Dried vells, including the salt	1 lb.
Rectified Spirit	1 quart
Distilled Water	3 quarts
Oil of Lemon, Oil of Bitter Orange, Oil of Dill of each	10 min.

Macerate for seven days, strain; add Kieselguhr 1 oz., shake well every day for a week, then filter.

The agitation with Kieselguhr facilitates filtration, which is sometimes difficult.

NOTE.—The vells should not be older than three weeks or so if a light-coloured preparation is required. Vells several months old give a sherry-coloured essence.

Essence of Caraway

Caraway Seeds, bruised	2 oz.
Oil of Caraway	½ fl. dr.
70 per cent. Alcohol to produce	1 pint

Essence of Cinnamon

Cinnamon, bruised	2 oz.
Oil of Cinnamon	½ fl. dr.
70 per cent. Alcohol to produce	1 pint

Essence of Clove

Cloves, bruised	2 oz.
Oil of Clove	½ fl. dr.
70 per cent. Alcohol to produce	1 pint

Essence of Nutmeg

Grated Nutmegs	2 oz.
Oil of Nutmeg	½ fl. dr.
70 per cent. Alcohol to produce	1 pint

Essence of Rose

Otto of Rose . . .	30 min.
Cochineal	1 dr.
70 per cent. Alcohol to produce	1 pint

Soluble Essence of Ginger

Take of strong Tincture of Jamaica Ginger (1 = 1) 1 pint ; add, in small portions at a time, finely powdered Slaked Lime, vigorously shaking after each addition, until the tincture ceases to lose colour. Throw the whole upon a filter, and pass Proof Spirit through the residue until the filtrate measures 2 pints.

Add, drop by drop, Dilute Sulphuric Acid until the rich red colour of the tincture suddenly disappears. Stand for twenty-four hours, filter, dilute with distilled water to 4 pints, shake with Kieselguhr, and filter at as low a temperature as possible.

Essence of Coffee

Freshly roasted and ground Coffee . . .	1 lb.
Freshly roasted and ground Chicory . . .	¼ ,,

Mix with 1½ pint boiling water, stand until cold, express strongly, reserving the expressed liquor. Exhaust the Coffee with boiling water, concentrate to extract, and add to the reserved portion. Bring the whole to the boil, add Salicylic Acid 3 grains, mix, filter, and make product measure 1 pint.

Fruit Syrups

Take fresh ripe fruit, such as black currants, raspberries, strawberries, cherries, free from stems and leaves, and press out the juice. To each pint of juice add—

Salicylic Acid . . .	2 gr.
Glycerin	½ fl. oz.
Sugar	1½ lb.

Heat to dissolve and strain through flannel. A little mixed with aerated water makes a refreshing drink.

HARMLESS COLOURS, SUITABLE FOR CULINARY PURPOSES

Bluish-Red

Black Currant, 6708.

Brown

Caramel B.

Orange

Azo-Orange.

Red

Carthamine, 11664.
Cochineal.
Eosin, 19729.
Raspberry Red, 45612.

Yellow

Lemon Yellow, 19943.

FOOD STUFFS

Baking Powders

NOTE.—*All ingredients to be stove-dried before mixing. Sift through fine sieve.*

1.	Tartaric Acid	2 lb.
	Bicarbonate of Soda	2 ,,
	Arrowroot or Corn Flour	3 ,,
2.	Tartaric Acid	3 lb.
	Bicarbonate of Soda	4 ,,
	Arrowroot or Corn Flour	6 ,,

Quick Baking Powder

3.	Cream of Tartar	4 lb.
	Sodium Bicarbonate	2 ,,
	Ammonium Carbonate	1 oz.
	Rice Flour	2 lb.
4.	Acid Sulphate of Potassium	3½ lb.
	Sodium Bicarbonate	4 ,,
	Arrowroot or Corn Flour	7 ,,

Custard Powders

Basis

Arrowroot or Corn Flour	7 lb.
Lemon Yellow, 19943, dissolved in Spirit	a sufficiency.

Flavourings for each pound of tinted Arrowroot:

1.	Essential Oil of Almond	15 min.
	Vanillin	1 gr.
2.	Vanillin	3 gr.
	Essential Oil of Almond	10 min.
3.	Oil of Lemon	1 fl. dr.
	Essential Oil of Almond	1 drop
	Oil of Nutmeg	1 ,,

Blanc Mange Powder

The basis is Arrowroot or Corn Flour. Flavourings may be those given under ' Custard Powders.'

Ice Cream Powder

1.	Corn Flour	½ lb.
	Castor Sugar	½ ,,
	Vanilla Essence	2 fl. dr.
	Azo-Orange Dye, dissolved	to tint.

Two ounces of this is sufficient for one pint of milk.

2.	Corn Flour	½ lb.
	Castor Sugar	½ ,,
	Essence of Almond	1 fl. dr.
	Essence of Vanilla	1 ,,
	Lemon Yellow, 19943, dissolved	to tint

A number of varieties may be made by using the artificial essences and suitable colours given elsewhere in this book.

Egg Powder

Rice Flour	1½ lb.
Sodium Bicarbonate	1 ,,
Tartaric Acid	¼ ,,
Cream of Tartar	½ ,,
Azo-Orange Dye in dilute spirit	a sufficiency

Curry Powder

In the manufacture of curry powder the most important point to remember is that all ingredients must be *fresh*, and also *freshly ground*. Preferably they should be ground together.

1.	Coriander	2 lb.
	Black Pepper	1 ,,
	Turmeric	1 ,,
	Fœnugreek	½ ,,
	Cumin	6 oz.
	Cayenne	4 ,,
2.	Black Pepper	12 oz.
	Capsicum	2 ,,
	Coriander	32 ,,
	Fœnugreek	6 ,,
	Cinnamon	1 ,,
	Fennel	1 ,,
	Mustard	12 ,,
	Cardamoms	2 ,,
	Turmeric	16 ,,
	Cumin	2 ,,

Foods for Infants and Invalids

1.	Baked Flour	1 lb.
	Biscuit Powder	1 ,,
	Powdered Malt	¼ ,,
	Milk Sugar	¼ ,,
	Cane Sugar	2 oz.
2.	Desiccated Milk Powder	1 lb.
	Milk Sugar	¼ ,,
	Malted Flour	¼ ,,
	Cane Sugar	2 oz.
3.	Desiccated Milk Powder	1 lb.
	Baked Wheat Flour	¼ ,,
	Barley Malt Flour	¼ ,,
	Bicarbonate of Soda	1 dr.
4.	Desiccated Milk Powder	1 lb.
	Malted Wheat Flour	1 ,,
	Milk Sugar	¼ ,,
5.	Desiccated Milk Powder	1 lb.
	Milk Sugar	¼ ,,
	Cane Sugar	2 oz.
	Baked Wheat Flour	1 lb.
6.	Desiccated Milk Powder	1 lb.
	Desiccated Malt Extract	1 ,,
7.	Desiccated Milk Powder	1 lb.
	Desiccated Malt Extract	1 ,,
	Biscuit Powder	1 ,,

Mayonnaise Dressing for Salads, &c.

1.	Fine Gelatin	1 dr.
	Brown Vinegar	½ pint

Allow to soften, warm *very gently* until dissolved, and add slowly to the following in an emulsifying machine :

Two Eggs (including whites).	
Salad Oil	½ pint

Emulsify and add by degrees the following mixture—

Tincture of Black Pepper (4 oz. to 1 pint)	2 fl. dr.
Salt	½ oz.
Mustard	1 ,,
Salicylic Acid	3 gr. = ½ gramme
Water	1½ fl. oz.

Emulsify again until perfectly smooth. The result should be a yellowish creamy paste, which can be poured out of a fairly wide-mouth bottle.

2. Salad Oil	1 pint
Powdered Acacia	4 oz.
Powdered Mustard	1½ ,,

Mix, and add, all at once—

Distilled Water	6 fl. oz.

Emulsify, and add the contents of a large tin of Nestle's milk (sweetened). Mix, and add the following mixture :

Salt	3 dr.
Acetic Acid	4 fl. oz.
Vinegar	14 ,,
Colour to taste.	

If too thick, add more vingear. If not sweet enough, add simple syrup.

Tomato Chutney

Ripe Tomatoes	3 lb.
Vinegar	¾ pint
Cayenne	½ oz.
Sugar	1 lb.
Raisins, *pulped*	1½ ,,
Apples, sliced	½ ,,
Bananas, peeled and sliced	¼ ,,
Powdered Ginger	1 oz.
Powdered Black Pepper	¼ ,,
Shallots, bruised	1 ,,
Salt	2 ,,

Boil the tomatoes and pulped raisins for five minutes, and strain. To the strained liquor add the other ingredients in a wide-mouth bung-jar. Tie the bung securely, and place in boiling water for one hour. Cool, bottle, and keep for at least three months before use.

Sauces of the ' Worcester ' Type

General Directions

Bruise all solid ingredients thoroughly, and place them with the liquids in a fairly wide mouth bung-jar. Fit a good bung, and tie down securely. Shake well.

Place the jar in a vessel containing water, and heat to boiling for two hours. Cool ; macerate for a week, shaking occasionally ; strain through coarse sieve, and set on one side to mature.

Shake well before bottling, so as to transfer an equal amount of deposit to each bottle.

NOTE.—*Vinegar is exceedingly volatile, and should never be heated in an open vessel, as recommended in so many formulas. There is absolutely no danger in heating the sauce in a closed jar, as directed.*

1. Shallots . . . . 5 oz.
   Cayenne . . . . ¼ ,,
   Black Pepper . . . ½ ,,
   Celery Seed . . . ¼ ,,
   Salt . . . . 1 ,,
   Cream of Tartar . . 2 ,,
   Ginger . . . . ½ ,,
   Caraway . . . . ¼ ,,
   Cloves . . . . ¼ ,,
   Nutmegs . . . . ¼ ,,
   Cardamoms . . . 1 dr.
   Cinnamon . . . 1 ,,
   Mushroom Ketchup . . 3 pints
   Soy . . . . 1 pint
   Port Wine . . . 1 ,,
   Marmalade . . . 4 oz.
   Vinegar to . . . 1 gal.

2. Shallots . . . . 4 oz.
   Black Pepper . . . 2 ,,
   Mustard . . . . 1 ,,
   Horseradish . . . 4 ,,
   Celery Seed . . . ½ ,,
   Salt . . . . 1 ,,
   Pimento . . . . 1½ ,,
   Ginger . . . . ½ ,,
   Mace . . . . 1 dr.
   Cardamoms . . . 1 ,,
   Anchovies . . . ½ lb.
   Mushroom Ketchup . . 5 pints
   Soy . . . . ½ pint
   Marmalade . . . 4 oz.
   Vinegar to . . . 1 gal.

3. Shallots . . . . 8 oz.
   Cayenne . . . . 1 ,,
   Mustard . . . . 3 ,,
   Salt . . . . 4 ,,
   Sugar . . . . 1 ,,
   Mace . . . . ¼ ,,
   Cinnamon . . . ¼ ,,
   Mushroom Ketchup . . 2 pints
   Soy . . . . 2 ,,
   Vinegar to . . . 1 gal.

4. Shallots . . . . 6 oz.
   Black Pepper . . . 4 ,,
   Horseradish . . . 4 ,,
   Salt . . . . 4 ,,
   Pimento . . . . 1 ,,
   Lemon Peel . . . ½ ,,

	Caraway	¼ oz.
	Coriander	1 dr.
	Mushroom Ketchup	½ gal.
	Walnut Ketchup	½ ,,
5.	Garlic	½ oz.
	Shallots	4 ,,
	Cayenne	¾ ,,
	Black Pepper	2 ,,
	Horseradish	2 ,,
	Tamarinds	4 ,,
	Pimento	1 ,,
	Lemon Peel	1 ,,
	Sugar	1 ,,
	Cloves	1 dr.
	Nutmegs	1 ,,
	Cardamoms	1 ,,
	Anchovies	1 lb.
	Mushroom Ketchup	3 pints
	Walnut Ketchup	2 ,,
	Soy	½ pint
	Port Wine	½ ,,
	Vinegar to	1 gal.
6.	Shallots	3 oz.
	Cayenne	1 ,,
	Tamarinds	4 ,,
	Caraway	1 dr.
	Cloves	1 ,,
	Mace	¼ oz.
	Mushroom Ketchup	4 pints
	Soy	1 pint
	Vinegar to	1 gal.
7.	Shallots	6 oz.
	Cayenne	1 ,,
	Black Pepper	1 ,,
	Tamarinds	6 ,,
	Pimento	1 ,,
	Ginger	1 ,,
	Lemon Peel	1 ,,
	Nutmegs	¼ ,,
	Cinnamon	¼ ,,
	Anchovies	½ lb.
	Mushroom Ketchup	6 pints
	Vinegar to	1 gal.
8.	Garlic	1 oz.
	Shallots	2 ,,
	Cayenne	1 ,,
	Mustard	1 ,,
	Celery Seed	¼ ,,
	Salt	3 ,,

Ginger		½ oz.
Sugar		2 ,,
Cloves		¼ ,,
Mace		¼ ,,
Cardamoms		¼ ,,
Anchovies		¼ lb.
Soy		1 pint
Port Wine		1 ,,
Mushroom Ketchup		4 pints
Vinegar to		1 gal.

9.

Shallots		4 oz.
Cayenne		½ ,,
Black Pepper		1 ,,
Salt		1 ,,
Tamarinds		1 lb.
Ginger		½ oz.
Cloves		¼ ,,
Cinnamon		¼ ,,
Coriander		½ ,,
Soy		1 pint
Walnut Ketchup		2 pints
Vinegar to		1 gal.

Tomato Sauce

Tomato pulp, obtained by mashing ripe tomatoes	1 gal.

Boil for five minutes, and pour on to the following, all of which must be bruised :

Shallots		3 oz.
Cayenne		½ ,,
Lemon Peel, Mace, Ginger, Cardamoms, Caraway, Coriander, Cinnamon, Cochineal, Celery Seed	of each	¼ oz.
	of each	1 dr.

Stand until cold ; strain through hair sieve, and add—

Acetic Acid, B.P.	10 oz.
Powdered Tragacanth	200 gr.
Rectified Spirit	½ oz.

Allow to macerate for a month before use.

NOTE. —A much finer sauce is obtained by using the ' Tomato Purée,' which may be obtained at most wholesale provision stores.

Anchovy Paste

Fresh Anchovies	7 lb.

Mash well in a stone mortar, transfer to suitable vessel, and boil for ten minutes with—

Brown Vinegar	2 pints.

Pulp through a hair sieve, and to the paste add—

Finely powdered Ginger	½ oz.
Finely powdered Cayenne	1 dr.
Salicylic Acid	1 ,,
Salt	1 lb.
Annatto and Essence of Cochineal	sufficient to colour
Maize Starch	¼ lb., or sufficient to thicken

Bring the whole to the boil.

Walnut Ketchup

Crushed Green Walnuts	7 lb.
Salt	2 ,,
Vinegar	1 gal.

Boil for five minutes, and add aromatics as directed under ' Mushroom Ketchup,' using the same proportions for each gallon of liquor.

Mushroom Ketchup

Take fresh mushrooms, bruise well, and boil for two or three minutes, strain and press.

To each gallon of juice add—

Acetic Acid, B.P.	5 fl. oz.
Bruised Pepper	½ oz.
,, Ginger	1 ,,
,, Pimento	¼ ,,
,, Mace	¼ ,,
,, Cinnamon	¼ ,,
,, Cardamoms	1 dr.
Salt	2 oz.

Bring just to the boil, place in a corked bung-jar, and macerate for one month. Strain, press, and filter.

French Mustard

Mustard	9 oz.
Sugar	1 oz.
Salt	1 ,,
Pepper, ground	½ ,,
Cinnamon, ground	¼ ,,
Cardamoms, ground	1 dr.
Ginger, ground	1 dr.
Tarragon Vinegar	a sufficiency

Tarragon Vinegar

Take tarragon leaves (*Artemisia Dracunculus*) and bruise well. Cover with best brown vinegar, and macerate for a month.

NOTE.—For each gallon of vinegar employed add—

Cloves	1 dr.
Ginger	1 ,,
Black Pepper	2 ,,

ICE CREAM

1.

Milk	1 quart
Eggs	three
Sugar	½ lb.
Arrowroot	3 teaspoonfuls
Unsweetened Condensed Milk	1 large tin
Vanilla Essence	3 teaspoonfuls
Fresh Cream	¼ pint

Mix the fresh milk and the condensed milk, add the sugar and heat. Beat the eggs and when the milk is nearly boiling pour over the eggs and mix. Return to the pan and add the arrowroot previously mixed to a smooth cream with a little cold milk. Heat until the custard thickens, strain, cool, and add the vanilla and cream. Freeze.

2.

Milk	3 pints
Eggs	six
Sugar	¾ lb.
Flavouring	to taste
Fresh Cream	1 pint

Method as above.

3.

Fresh Cream	2 pints
Sugar	¼ lb.
Flavouring	to taste

4.

Milk	2 pints
Sugar	¼ lb.
Corn Flour	1½ oz.
Flavouring	to taste

Make a custard and freeze.

Ice Cream, Coffee

Ground Coffee	4 tablespoonfuls
Milk	1 teacupful
Fresh Cream	1 ,, ,,
Sugar	4 tablespoonfuls
Salt	a pinch

Add the coffee to the milk, simmer for two or three minutes, and strain. Add the remaining ingredients, strain and freeze.

Ice Cream, Pine Apple

Pineapple Juice	8 fl. oz.
Lemon Juice	½ ,,
Sugar	½ lb.
Fresh Cream	2 pints

Ice Cream, Strawberry

Strawberries	2 quarts
Castor Sugar	¾ lb.
Milk	3 pints
Cream	1 quart
Strawberry Colouring	a sufficiency

Crush strawberries and pass through a fine sieve. Add sugar, milk and cream, colour and freeze.

WATER ICES

Apple

Apple Juice	1 pint
Simple Syrup	½ ,,
Juice of one Lemon	

Freeze.

Apricot

Apricot Jam	2 lb.
Water	1 pint
Juice of two Lemons	

Mix the apricot jam with the water and pass through a fine sieve, add the lemon juice. Freeze.

Cherry

Cherries	2 lb.
Sugar	2 ,,
Water	1 quart
Lemon Juice	1 oz.
Essence of Peach Kernel	10 min.

Stone and mash the cherries, add the sugar and water. Stir until the sugar is dissolved, add the lemon juice and essence. Freeze.

Lemon

Lemons	5
Water	2 quarts
Sugar	2 lb.

Peel lemons thinly, and squeeze out the juice. Put the peel, juice and sugar in a pan with 1 quart of water. Heat to dissolve sugar. Add the remaining water. Strain and freeze.

Orange

Orange Juice	1 pint
Juice of one Lemon	
Tincture of Orange Peel	1 fl. dr.
Simple Syrup	2 pints
Water	4 ,,

Freeze.

Strawberry

Strawberry Juice	2 pints
Simple Syrup	2 ,,
Water	2 ,,
Juice of one Lemon	
Raspberry Red	to colour

Freeze.

Mixed Fruit

Fresh Fruits, in season	¾ lb.
Orange Juice	¼ pint
Simple Syrup	1 ,,
Water	1 ,,
Juice of two Lemons	
Vanilla Essence	1 fl. dr.

Cut the fruits into small pieces. Mix with the water, syrup and juices. Add the vanilla, and freeze.

CONFECTIONERY

Lemon Toffee

Sugar	3½ lb.
Cream of Tartar	1 eggspoonful
Water	1 pint
Oil of Lemon	1 teaspoonful
Lemon Yellow	a sufficiency

Place the sugar and water in a small brass or enamelled pan and heat on fire or gas stove until the sugar is dissolved. Add the Cream of Tartar and allow to boil for ten minutes. Place a thermometer in the pan and keep the mixture boiling until it registers 310° F. Remove the thermometer, add the oil of lemon, stir well and pour into a shallow tray. When partly cool mark the

surface into squares so that when cold it may be easily broken.

Butter Scotch

Sugar	4 lb.
Butter	½ ,,
Cream of Tartar	1 eggspoonful
Water	1 pint
Oil of Lemon	1 teaspoonful

Place the sugar and water in pan and heat until dissolved. Add the Cream of Tartar and boil to 300° F. Remove pan from heat and add the butter in small pieces. Place pan on heat again, add the oil of lemon and boil for several minutes until butter is thoroughly mixed. Pour into a shallow tray and when partly cool mark into squares.

Everton Toffee

Brown Sugar	½ lb.
White Sugar	3 ,,
Butter	½ ,,
Cream of Tartar	1 eggspoonful
Water	1 pint
Oil of Lemon	1 teaspoonful

Proceed as for Butter Scotch.

Almond Rock

Brown Sugar	2½ lb.
Glucose	¾ ,,
Sweet Almonds	1¾ ,,
Water	¾ pint

Dissolve the sugar and glucose in the water, boil up to 310° F. and pour on to an oiled plate. Sprinkle the almonds, previously blanched, over the surface of the toffee. When sufficiently cooled, knead the whole, to mix the almonds. When firm make a long roll and quickly cut into slices.

French Almond Rock

Sugar	3 lb.
Glucose	¾ ,,
Sweet Almonds	1½ ,,
Water	1 pint

Proceed as for Almond Rock, but add the blanched almonds to the boil as soon as it reaches 310° F. Stir constantly to prevent almonds sticking to pan, boiling until it turns a light golden brown ; then pour.

Nut Toffee

Walnuts,		
Brazil nuts,		
Almonds, blanched and slightly roasted,		
Glacé cherries,		
Cocoanut, sliced	of each	¼ lb.
Sugar		2 ,,
Glucose		1¼ ,,
Water		½ pint

Boil the sugar and glucose in the water to 290° F. Remove the pan from the heat, stir in the mixed nuts, place on the fire to warm through and pour on to an oiled shallow tray to cool.

Toffee Apples

Boil brown sugar with a pinch of Cream of Tartar to 280° F. Dip apples in this and stand in a sieve to cool.

Cough Candy

Brown Sugar	3½ lb.
Horehound Herb	2 oz.
Oil of Anise	1 teaspoonful
Water	1½ pint

Boil the water and herb slowly for fifteen minutes and strain. Add the sugar to the clear liquor and boil to 255° F. Remove from heat and rub the syrup against side of pan with spatula until it becomes opaque. Add the Oil of Anise and stir until it becomes a dark thick cloudy mass. Pour.

White Cocoanut Candy

White Sugar	7 lb.
Water	1½ pint
Cocoanuts, peeled and sliced	three

Boil the sugar and water to 250° F. and add the sliced cocoanut, keeping the boil well stirred. Remove from heat and rub the syrup with spatula until it turns an opaque white. Turn out on to a slab. Cut into bars when cool.

(Chocolate or Fruit Candy may be made the same way.)

Walnut Cream

Sugar	4 lb.
Glucose	1½ ,,
Walnuts, shelled	1 ,,
Cocoanut, desiccated	1 ,,
Vanilla Essence	1 teaspoonful
Water	1 pint

Boil the sugar, glucose and water to 240° F. Remove from heat and set aside to get quite cold. Place pan on gentle heat and move the mass until it thins a little. When as warm as the finger can conveniently bear, remove the pan from heat and work up with a spatula until white and creamy. Add the cocoanut and vanilla. When well mixed add the walnuts and beat until quite stiff. Remove about one-third into another pan and colour pink with Essence of Cochineal. Line a suitable frame with waxed paper, pour in half the white cream, then the pink, and finally the remainder of the white. Stand. When cool cut into bars with a wire.

Barcelona Cream

Sugar	4 lb.
Glucose	1½ ,,
Barcelona Nuts, shelled	1 ,,
Desiccated Cocoanut	1 ,,
Vanilla Essence	1 teaspoonful
Water	1 pint

Proceed as for Walnut Cream.

Cocoanut Ice

Sugar	4 lb.
Glucose	1½ ,,
Desiccated Cocoanut	1 ,,
Water	1 pint
Vanilla Essence	1 teaspoonful

Proceed as for Walnut Cream.

Jap Nuggets

White Sugar	1 lb.
Glucose	2 ,,
Desiccated Cocoanut	2 ,,
Farina	¾ ,,
Water	1 pint
Lemon Yellow	to tint

Mix the ingredients in a copper pan. Boil slowly to 250° F. with constant stirring. Colour to fancy. Pour on to a slab to produce a sheet about ½ inch thick. When cold dust with icing sugar and cut into cubes.

Bulgarian Nougat

White Sugar	7½ lb.
Glucose	1¾ ,,
Almonds, blanched	1¾ ,,
Fondant Cream	1¾ ,,
Gelatin, Sheet	14 oz.
Vanilla Essence	1 teaspoonful
Water	a sufficiency

Cover the gelatin with cold water, stand for five minutes and pour off the excess of water. Stand one or two hours to soften. Dissolve the sugar and glucose in one pint water and boil to 250° F. Add the gelatin and stir until dissolved. Add the fondant cream and then the almonds and vanilla. Beat the whole well for two hours and pour into moulds lined with wafer paper. Cut into bars when cold. By varying the colour and flavour other varieties as almond, raspberry, &c. may be made.

Vanilla Nougat

White Sugar	1 lb.
White Sugar	1 lb.
Honey	2 ,,
Glucose	½ ,,
Sweet Almonds, blanched	3½ ,,
White of Eggs	6
Vanilla Essence	2 teaspoonfuls

Beat the white of eggs to a thick froth. Put sugar, honey and glucose into pan and place over slow heat, stirring constantly with wooden spatula for about two hours until mass thickens. Then add the beaten egg white and stir to 250° F. Add the almonds and the vanilla, stirring well. Pour the mixture on to wafer paper in frame about one inch deep. Cover with wafer paper. When cold cut into bars.

Vanilla Caramels

Sugar	4 lb.
Glucose	1 ,,
Butter	½ ,,
Condensed Milk	1 tin
Water	1 pint
Vanilla Essence	2 teaspoonfuls

Boil the sugar, glucose and water to 250° F. Remove to slow heat and add the condensed milk and butter (previously cut into small pieces). Stir well with wooden spatula, bring gently to boil and pour on to greased frame about half inch deep. When set, cut into cubes. Wrap in waxed paper.

Cocoanut Caramels

Sugar	4 lb.
Glucose	1 ,,
Butter	½ ,,
Desiccated Cocoanut	¾ ,,
Condensed Milk	1 tin
Water	1 pint

Proceed as for Vanilla Caramels, adding the cocoanut with the condensed milk and butter.

Walnut Caramels

Proceed as for Cocoanut Caramels, replacing the cocoanut with ½ lb. shelled walnuts broken small.

Chocolate Caramels

Exactly as for Vanilla Caramels with the addition of ¼ lb. pure chocolate at the same time as the condensed milk and butter.

Burnt Almonds

White Sugar	2½ lb.
Almonds	1¼ ,,
Water	1 pint
Flavouring.	
Colouring	as required

Boil the sugar and water in a pan and add the almonds. Stir constantly to 250. F. Remove pan from heat and rub the syrup on pan with spatula until creamy. Then stir all together until granular. Turn on to a coarse sieve and shake well to separate any adhering almonds. Divide into as many lots as there are different colours and flavours required. Place one lot with its share of siftings, together with colouring and flavouring, into the pan standing over the heat *on an iron sheet.* The siftings will gradually melt and adhere to the almonds, which will become crisp when done. This is best judged by tasting.

Suitable colours and flavours will be found in this book.

Vanilla Fondants

White Sugar	5 lb.
Glucose	1¼ ,,
Water	1½ pints
Vanilla Essence	2 teaspoonfuls

Boil the sugar, glucose and water to 245° F. and pour on to a damp slab. Stand until nearly cold, then work up with spatula to a glossy cream. Re-melt the cream very gently and pour into depressions made in a shallow tray of starch powder or cornflour.

A variety of fondants may be made by varying the flavourings and adding suitable colourings.

Marrons Glacés

White Sugar	1 lb.
Water	¾ pint
Vanilla Essence	1 teaspoonful

Boil the sugar and water to 240° F. and add the vanilla essence.

Select sound, fine chestnuts, slit the skins, put them into boiling water and cook for five to ten minutes until both skins can be removed. When peeled, drain and put into a clean enamelled pan with enough of the vanilla syrup to cover. Simmer until the chestnuts are soft, but do not let them break. Cool and stand overnight, then bring again to the boil, remove the chestnuts and drain on a sieve. Make a fresh syrup as follows :

White Sugar . . .	1 lb.
Water . . .	¼ pint

Boil to 260° F. Remove from heat and work the syrup against the pan until nearly cold. Then dip the chestnuts one by one on a skewer. Place on trays to dry.

FOOD PRESERVATIVES

Although food preservatives are not regarded with great favour by public analysts, a very large trade is done in them. Two objections are urged against their uncontrolled use :

(*a*) That they enable unsound food to be passed off as sound and wholesome.
(*b*) That the daily ingestion of even small quantities of many preservatives is deterimental to health.

There is, however, a fairly general consensus of opinion that while the indiscriminate use of preservatives should be discouraged, no harm is likely to accrue by the employment of certain chemicals in strictly limited quantities.

The following are the preservatives in general use for foods :

Benzoic Acid	*Formaldehyde*
Boric Acid	*Fluorides*
Borax	*Silico-fluorides*
Sulphites	
Salicylic Acid	

Those in italics are regarded by medical men and analysts with suspicion.

Borax and Boric Acid

Although Boric Acid is the more active bactericide of the two, it is not generally used alone. Many compounds containing varying proportions of Borax and Boric Acid have been placed on the market under all sorts of fanciful names for the preservation of milk, butter, eggs, meat, &c. For all practical purposes, however, a

mixture of equal parts of each gives general satisfaction. The mixture should be exposed in heaps for several days before packing. If necessary, dry and re-powder.

Butter.—Use Boric Acid alone. Mix it with common salt in the proportion of 1 part to 20 parts.

Meat, Fish, Poultry.—Dissolve about a tablespoonful of the mixture in a pint of tepid water, and use as a paint or spray. An even better plan is to wrap the food in linen cloths which have been wrung out of the liquid.

Salicylic Acid

This is useless if employed in combination with an alkali. The free acid must always be used.

One grain per lb. will prevent jam, marmalade, &c., from fermenting.

Two grains per lb. will prevent the growth of mould on the surface.

One grain per pint will preserve lemonade, &c.

Two grains per pint will preserve weak alcoholic syrupy liquids, as ginger wine, &c.

Two grains per gallon will keep milk sweet for twenty-four hours.

Glyceroborate of Soda

Glycerin,
Sodium Borate . . equal parts by weight

Heat together, with constant stirring, until a drop allowed to fall on a porcelain slab forms a brittle, transparent bead when cold.

Pour out on the slab, cool, break into fragments, and preserve in a stoppered bottle.

Glyceroborate of Lime

Made by heating equal parts of Glycerin and Calcium Borate as above.

Both are powerful antiseptics, and both are freely soluble in either alcohol or water.

PAINTS, DISTEMPERS

Anti-Corrosive Paint

Medium Soft Coal-Tar Pitch .	35 lb.
Asphaltum . . .	25 ,,

Heat together with stirring until melted. Temperature should rise to about 300° F. for a few minutes.

Remove from heat, cool to about 250° F. and gradually add, with constant stirring :

Litharge Oil Emulsion . . 2 lb

When perfectly smooth, add gradually—

Solvent Naphtha . . 7 gals.

The Litharge Oil emulsion is prepared by grinding 30 parts of litharge with 10 parts of raw linseed oil and working in one part of water.

Luminous Paints

1. Lennard's Compound

Strontium Carbonate . .	1,000 parts
Sulphur	1,000 ,,
Potassium Chloride . .	5 ,,
Sodium Chloride. . .	5 ,,
Manganese Chloride . .	4 ,,

Mix and heat to white heat for half an hour. It emits a golden-yellow light.

2. Mourelos' Compound

Strontium Carbonate . .	1,000 parts
Sulphur	300 ,,
Sodium Carbonate . .	20 ,,
Sodium Chloride . .	5 ,,
Manganese Sulphate . .	2 ,,

Heat to redness for half an hour. It emits a pale yellow light.

3. Balmain's Compound

Calcium Oxide (iron free) .	2,000 parts
Sulphur	600 ,,
Starch	200 ,,
Bismuth Nitrate Solution (5 per cent.) . . .	100 ,,
Potassium Chloride . .	15 ,,
Sodium Chloride . .	15 ,,

Mix. Dry. Heated to redness and cooled, it emits violet light.

Gold Enamel Paint

White-hard Varnish . .	1 gal.
Alcohol	¾ ,,
Gold bronze . . .	12 lb.
Mica, finely powdered .	3 oz.

Mix the varnish and alcohol ; mix the mica with the gold bronze, and add to the first mixture.

Water-Colour Distempers

In the preparation of these distempers, *soluble* casein is largely used as the binder. The popularity of casein as a binder is based upon the fact that it is soluble in water in the presence of alkalies, and that when the solution is brushed on a surface the casein, under the influence of the air, soon reverts to its insoluble condition. The following are typical formulas for casein distempers :

For a White Water Paint.

1. Paris White
   Whiting
   Slaked Lime . of each 8 lb.
   Casein
   Glue
   Alum . . of each 1½ ,,
   Silicate of Soda . . . 2 ,,
   Water . . . . A sufficiency.

   Make of the consistency of cream.

2. Soluble Casein . . . 3 lb.
   Slaked Lime . . . 3 ,,
   Borax . . . . ½ oz.
   Precipitated Chalk . . 24 lb.
   Fine Ultramarine Blue . ½ oz.

To obtain a good colour case, the quicklime should be prepared from marble, and it should be slaked with three times its weight of hot water.

For a Blue Water Paint.

Soluble Casein . . . 3 lb.
Slaked Lime . . . 3 ,,
Borax . . . . ½ oz.
Precipitated Chalk . . 18 lb.
Bremen Blue . . . 6 ,,

Rose-red.

Soluble Casein . . . 3 lb.
Slaked Lime . . . 3 ,,
Borax . . . . ½ oz.
Precipitated Chalk . . 23 lb.
Burnt Sienna . . . ½ ,,
Vermilion . . . . 1 ,,

Yellow.

Soluble Casein . . . 3 lb.
Slaked Lime . . . 3 ,,
Borax . . . . ½ oz.
Precipitated Chalk . . 20 lb.
Naples Yellow . . . 3½ ,,
Yellow Ochre . . . ½ ,,

For exterior painting, the addition of Magnesium Silicate to the Casein paint gives coatings almost as resistant to atmospheric conditions as oil paints. The following is a typical base formula :—

Soluble Casein	3 lb.
Slaked Lime	4 ,,
Precipitated Chalk	2 ,,
Borax	½ oz.
Magnesium Silicate	22 lb.

The coatings obtained with this are fast to water, hard, and can be washed over or varnished a few days after application. The majority of Casein paints contain a certain amount of antiseptic.

VARNISHES

Bottle-cap Varnish

Red Sealing Wax	6 oz.
Methylated Spirit	1 pint.

Celluloid Varnish

Celluloid Trimmings	1 oz.
Acetone	½ pint
Amyl Acetate	½ ,,

Dissolve.

Label Varnish (Paper)

1. Canada Balsam . . . 8 oz.

Place on an old plate in the oven overnight when the fire is very low. Remove next morning, and add to—

	Oil of Turpentine	15 oz.
2.	White Shellac	¾ oz.
	Mastic	2 ,,
	Venice Turpentine	¼ ,,
	Acetone	4 ,,
	Methylated Spirit	12 ,,

Dissolve by gentle warmth. Add ½ oz. of dry Kieselguhr (recently ignited) to absorb moisture and wax, and either filter or allow to deposit and pour off.

3.	Copal	4 oz.
	Ether	
	Acetone	
	95 per cent. Alcohol	of each 5 fl. oz.

This is a very quick drying varnish, but it is very hard and durable.

Size for Paper Labels

Gelatin	1 oz.
Water	20 fl. oz.

Allow to soften, and dissolve by gentle heat.

NOTE.—Labels that have been recently written must be allowed to dry for two or three days before sizing, or the ink will probably run. If it is necessary to size a newly written label at once, it should be done with—

Hard Paraffin	1 dr.
Benzol	10 fl. oz.

Warm gently until dissolved. Apply two coats. This dries immediately, and the labels are ready for varnishing at once. It is much to be preferred to a watery size.

Gold Label Varnish

Mastic	2 oz.
Sandarac	2 ,,
Venice Turpentine	¼ ,,
Methylated Spirit	1 pint

Aqueous Shellac Varnish

Shellac	1 part
Saturated Solution of Borax.	3 parts

Macerate, with occasional shaking for several days. Useful for imparting a gloss to maps, prints, &c.

Violin Varnish

Copal	½ lb.
Mastic	1 oz.
Shellac	½ ,,
Canada Balsam	1 ,,
Camphor	1 ,,
Methylated Spirit	2 pints

Black-Board Varnish

1.	Sandarac	3 oz.
	Shellac	3 ,,
	Mastic	1 ,,
	Lampblack	2 ,,
	Ultramarine	¼ ,,
	Finely-ground Emery	¼ ,,
	Methylated Spirit	1½ pints
2.	Shellac	10 parts
	Lampblack	5 ,,
	Finely-powdered Emery	2½ ,,
	Ultramarine	2½ ,,
	Methylated Spirit	100 ,,

Sodium Silicate diluted with water and coloured with a sufficient quantity of lampblack is said to make a very good surface. The surface of the board should be smooth and free from grease before coating, and it is always advisable to strain the composition through fine muslin in order to separate any rough particles.

Dead Black Coating for Wood

Borax	30 grs.
Glycerin	30 mins.
Shellac	60 grs.
Water	8 oz.

Boil until dissolved, and add—

Nigrosin W.S.	60 grs.

Varnish for Chocolates

1.	Shellac	1 oz.
	Rectified Spirit	1 pint
2.	Gum Benzoin	2 ozs.
	Rectified Spirit	1 pint

LACQUERS

The metal surfaces must be scoured clean and free from grease. After lacquering the articles must be baked at a temperature of about 100–150° F. for a few minutes until the lacquer melts.

Gold Lacquer

1.	Shellac	2 oz.
	Saffron	1 dr.
	Turmeric	1 oz.
	Methylated Spirit	2 pints

Macerate for a week at 100° F. and filter.

2.	Shellac	2 oz.
	Dragon's Blood	¼ ,,
	Tumeric	⅛ ,,
	Methylated Spirit	1 pint
3.	Shellac	2 oz.
	Gamboge	½ ,,
	Annatto	⅛ ,,
	Methylated Spirit	1 pint
4.	Shellac	2 oz.
	Gamboge	¼ ,,
	Sandarac	½ ,,
	Saffron	½ dr.
	Methylated Spirit	1 pint.

5. Copal . . . . ½ oz.

Powder and heat on a water bath for twenty-four hours. Add to—

Shellac	2 oz.
Gamboge	1 dr.
Tumeric	1 ,,
Saffron	1 ,,
Annatto	½ ,,
Methylated Spirit	1 pint

Macerate at about 120° F. for a week.

6.

Shellac	200 parts
Sandarac	80 ,,
Mastic	80 ,,
Gamboge	20 ,,
Dragon's Blood	20 ,,
Annatto	20 ,,
Venice Turpentine	60 ,,
Alcohol	1,000 ,,

WOOD STAINS

1. Solution of Ammonia. Darkens oak, especially when applied as a vapour.
2. Ferrous Sulphate solution, rendered faintly acid with Sulphuric Acid. A weak solution stains most woods green, the tint varying.
3. Picric Acid solution. Stains all white woods yellow.
4. Potassium Bichromate solution. Stains wood brown.
5. Permanganate of Potash solution. Stains wood a walnut colour.

Light Brown Stain

Catechu	¼ oz.
Caustic Soda	¼ ,,
Water	1 pint

Apply while hot.

Mahogany Stain

Dragon's Blood	30 gr.
Madder	2 lb.
Logwood	½ ,,
Caustic Potash	30 gr.
Water	1 gal.

Boil for about an hour, strain, and use the stain while warm.

Black or Ebony Stain for Oak

Immerse the wood in hot saturated solution of Alum for forty-eight hours, and then brush several times with strong decoction of Logwood (3 oz. to the pint) containing 10 drops of saturated neutral solution of Indigo in each quart.

Next, rapidly apply a hot filtered saturated solution of Verdigris in strong Acetic Acid until an intense black is produced. Dry and polish.

Brown Floor Stain

Glue	1 lb.
Water	1 gal.

Dissolve by aid of heat, cool somewhat, and add the following solution :

Potassium Bichromate	½ oz.
Bismarck Brown	1½ ,,
Water	½ pint

Oak Stain

1.	Raw Sienna, ground in water	4 oz.
	Burnt Sienna	2 ,,
	Vandyke Brown	2 ,,
	Boiling Water	1 pint
2.	Vandyke Brown	½ oz.
	Bismarck Brown	¼ ,,
	Nigrosin	½ ,,
	Methylated Spirit	1 pint

POLISHES, &c.

LEATHER-REVIVERS AND SIMILAR PREPARATIONS

Leather Reviver

Fresh Eggs	five
Sperm Oil	6 fl. oz.
Acetic Acid	¾ ,,
Glycerin	½ ,,
Oil of Birch Tar	¼ ,,
Oil of Turpentine	5 ,,
Methylated Spirit	5 ,,
Water to produce	30 ,,

Beat up the eggs thoroughly and emulsify the *mixed* oils. Lastly, add the Glycerin, Spirit, and Acetic Acid diluted with the bulk of the water.

Directions.—Pour about a teaspoonful on the worn surface and rub in gently with a soft rag. After a few minutes' interval polish with a clean rag.

Black Leather Reviver

Black (Logwood) Ink	1 quart
Soft Soap	1 oz.
Glycerin	1 dr.
Oil of Clove	10 min.

Yellow Leather Varnish or Reviver

Pale Shellac	10 oz.
Sandarac	10 ,,
Mastic	10 ,,
Venice Turpentine	4 ,,
Castor Oil	1 ,,
Oxalic Acid	1 ,,
Methylated Spirit to	200 fl. oz.

Dissolve and filter.

NOTE.—All grease and soap must be removed from the leather before application.

Red Russia Leather Varnish

Macerate 200 oz. of the above yellow leather varnish with—

Oil of Birch Tar	1 oz.
Fuchsin	1 ,,
Aniline Brown	¼ ,,

Dead-Black Leather Varnish

Macerate 200 oz. of the above yellow leather varnish with—

Yellow Wax	1 oz.
Nigrosin	2 ,,
Lampblack (sifted)	2 ,,

Waterproof Polish for Carriage Aprons

1.	Yellow Wax	2 oz.
	Turpentine	8 fl. oz.
	Black Japan	8 oz.
	Oak Varnish	4 ,,
2.	Pitch	2½ lb.
	Shellac	¼ ,,
	Caoutchouc	¼ ,,

Melt together in iron dish, and when somewhat cool add by degrees

	Oil of Turpentine to produce	1 gal.
3.	Tallow	¼ lb.
	Beeswax	2 oz.
	Burgundy Pitch	1 ,,
	Cod Liver Oil	15 fl. oz.
	Oil of Turpentine	1 ,,

BOOT AND SHOE POLISHES

White Cream for Boots

1. (A) Soft Soap . . . 11 oz.
Water . . . . 4 pints

Dissolve by gentle heat.

(B) White Beeswax . . 1 lb.
Hard Paraffin. . . 6 oz.

Melt together and add—

Oil of Turpentine . . 3 pints

Mix A and B, both hot. Shake well until emulsified. When somewhat cool, add—

Strong Solution of Ammonia. 6 fl. dr.

Shake well and bottle.

2. Beeswax . . . . 40 parts
Carnauba Wax . . . 10 „
Potassium Carbonate . . 6 „
Boiling Water . . . 60 „
Oil of Turpentine . . 800 „

Dissolve the Carbonate in the water ; melt the Waxes and add to the boiling solution. Mix well ; remove from the heat ; add 60 parts more hot water and stir until uniform. Gradually incorporate the oil.

Colours for above : *Yellow*—cerotin orange 6 parts ; *Brown*—oil-soluble brown 6 parts ; *Black*—oil-soluble black 3 parts. Dissolve the colours in the Turpentine.

Brown Cream for Boots

Use formula No. 1, but in place of *White* Beeswax use the *Yellow*, and to Solution A add—

Bismarck Brown. . . 2 oz.

NOTE.—If desired, Annatto may be used in place of the dye.

Black Cream for Boots

Use formula No. 1, but in place of *White* Beeswax use the *Yellow*, and to Solution A add—

Soluble Extract of Logwood 1 oz.
Nigrosin . . . . ¼ „
Aniline Blue . . . 1 dr.

When dissolved add—

Bichromate of Potash Solution (saturated) . . 1 fl. oz.

Brown Shoe Varnish

Camphor	¼ oz.
Venice Turpentine	2 ,,
Shellac	5 ,,
Bismarck Brown	½ ,,
Sandarac	½ ,,
Methylated Spirit	1 pint

Macerate at temperature of about 80° F. until dissolved. Shake frequently.

Apply with a sponge.

Black Shoe Varnish

Use formula for brown shoe varnish, but substitute the following for the Bismarck Brown :

Nigrosin	½ oz.
Aniline Blue	30 gr.

Brown Shoe Polish

Yellow Wax	2 oz.
Stearic Acid	1 ,,
Linseed Oil	1 fl. oz.

Melt together and add—

Oil of Turpentine	6 fl. oz.
Yellow Ochre, *in fine powder*	1 oz.
Raw Sienna, ,, ,,	1 dr.

Stir until somewhat cool, then add, stirring constantly—

Hard Soap	1 oz.
Water	5 fl. oz.

previously dissolved. Stir until cold. If colour is not bright enough, dissolve a little Bismarck Brown in the water.

Black Shoe Polish

Use formula for brown shoe polish, but substitute Ultramarine for the powdered earths and Nigrosin 4 dr. for the Bismarck Brown.

Varnish Polish

Shellac	7 oz.
Borax	120 gr.
Solution of Ammonia ·959	5½ fl. oz.
Aniline Black	30 gr.
Aniline Blue	10 ,,
Distilled Water	30 fl. oz.

Mix the Shellac, Borax, and Ammonia with 25 fl. oz. of water, and macerate, with frequent shaking, for a week.

Bring *slowly* to the boil, and boil for five minutes. Cool somewhat, and add the dyes dissolved in 5 oz. of the water.

The mixture must be kept well stirred during the heating operation.

Keep for several weeks before use, to ripen.

Applied with a sponge to *glacé* kid, &c., it leaves a brilliant black varnish, which is but little affected by water.

Old-fashioned Blacking

Bone-black	1 lb.
Lampblack	¼ ,,
Treacle	¾ ,,
Sperm Oil	2½ fl. oz.
Sulphuric Acid	1¼ ,,
Vinegar	5½ ,,

This forms a paste. Applied in the usual way it yields a really good polish.

Mix in the order named.

Patent-leather Varnish

Resin	1 oz.
Venice Turpentine	1 ,,
Oil of Turpentine	1 fl. oz.
Sandarac	2 oz.
Shellac	4 ,,
Methylated Spirit	30 fl. oz.
Lampblack	½ oz.

Waterproofing for Fishing Boots, &c.

Hard Paraffin	1 part
Castor Oil	3 parts
Lampblack	1 part
Rubber Shavings	¼ ,,

Soak the rubber in a little Chloroform for a few days until softened, then boil in the Castor Oil until dissolved. Add the Paraffin and Lampblack.

Blackening Tan Leather.

Rub the leather with a 10 per cent. solution of Tannic Acid in water. Allow to dry, and then apply a 10 per cent. solution of Iron Sulphate.

Cobbler's Wax

Swedish Pitch	2 lb.
Resin	1 ,,
Tallow	3 oz.

Melt together. When melted, pour into a bucket of cold water, and when it can be handled take it out and pull it and fold over, and pull again and again, just as a sugar-boiler pulls "seaside rock." Continue the process until a nice brown colour. If it gets too stiff before this happens, put it in some warm water and go on pulling. This is the secret of making good cobbler's wax. While plastic it is cut into small lumps.

Shoemaker's Heel Ball

Mutton Suet	4 oz.
Beeswax	1 ,,
Olive Oil	½ ,,

Melt together and add—

Oil of Turpentine	½ fl. oz.

When cooling, stir in—

Powdered Acacia	1 oz.
Lampblack	½ ,,

For taking rubbings of monumental brasses, &c., the Lampblack may be replaced by Aluminium Bronze.

To Clean Buckskin and Canvas Shoes

Zinc Oxide	1 oz.
Prepared Chalk	2 ,,
Tragacanth, powdered	20 gr.
Water	to 9 fl. oz.

Apply with a brush or sponge and allow to dry.

HARNESS AND SADDLE POLISHES

Harness Polishes

1. Hard Paraffin 2 lb.
   Carnauba Wax 8 oz.
   Beeswax 2 ,,
   Turpentine 4 pints

   Melt together; when cooling stir in—

   Lampblack 2 lb.
   Nigrosin 1 oz.
   Ultramarine ¼ ,,

2. Hard Paraffin,
   Yellow Wax,
   Mutton Suet of each 3 oz.

   Melt together, and add while hot—

   Oil of Turpentine 9 fl. oz.

Stir until thickening, and add by degrees the following mixture :

Eggs	two
Treacle	4 oz.
Lampblack	2 ,,
Ultramarine	¼ ,,
Soft Soap	2 ,,
Oil of Clove	20 min.

3.

Beeswax	1 lb.
Linseed Oil	4 fl. oz.
Soft Soap	6 oz.
Oil of Turpentine	6 fl. oz.
Ivory-black or Lampblack	4 oz.
Ultramarine	¼ ,,

Saddle Polish

Curd Soap	1 oz.
Water	8 fl. oz.

Dissolve and emulsify with—

Oil of Turpentine	6 fl. oz.
Beeswax	5 oz.

Melted together. Lastly add—

Methylated Spirit	1 fl. oz.

FURNITURE POLISHES OR REVIVERS

1.

Linseed Oil	2 fl. oz.
Methylated Spirit	2 ,,
Vinegar to	1 pint

2.

Linseed Oil	1 pint
Methylated Spirit	3 fl. oz.
Solution of Ammonia	4 fl. dr.
Solution of Antimony Chloride	1 fl. oz.
Dilute Acetic Acid	4 ,,

Mix in the order named. This is one of those apparently unscientific formulas which give very fair results.

3.

Yellow Wax	1 lb.

Melt and add—

Oil of Turpentine	50 oz.

When clear and still warm add all at once the following mixture :

Curd Soap	1 oz.
Solution of Potash (B.P.)	5 fl. oz.

previously dissolved by heat. Shake until emulsified. Dilute gradually to 4 pints with warm water.

This is a cream.

4. A modification of No. 3, which is said to yield a splendid polish, consists in previously dissolving as much Shellac in the Solution of Potash as it will take up.

5. Dragon's Blood . . . ¼ oz.
Oil of Turpentine . . 5 fl. oz.
Linseed Oil . . . 1 pint

Keep in warm place, shaking occasionally, for a week. Filter, and add—

Hydrochloric Acid . . ½ fl. oz.

Shake before using.

6. Linseed Oil . . . 1 pint
Methylated Spirit,
Vinegar,
Oil of Turpentine of each 1 fl. oz.
Hydrochloric Acid . . ½ ,,

7. Powdered Curd Soap . 1 oz.
Place in a hot mortar, and add, hot—
Yellow Wax . . . 4 oz.
Oil of Turpentine . . 4 fl. oz.
Stir, and add all at once—
Tepid Water . . . 8 fl. oz.

Stir until of creamy consistence. If too stiff, add more hot water.

8. A modification of No. 7 consists in substituting Resin ½ oz. for ½ oz. of the Wax.

Both may be coloured with a few grains of Alkannin.

9. Linseed Oil . . . 10 fl. oz.
Vinegar . . . . 5 ,,
Methylated Spirit . . 5 ,,
Hydrochloric Acid . . ½ ,,

French Polish

1. Shellac . . . . 1 lb.
Methylated Spirit . . ½ gal.

2. Shellac . . . . 14 oz.
Benzoin . . . . ½ ,,
Methylated Spirit . . 1 gal.

3. Shellac . . . . 16 oz.
Mastic . . . . 4 ,,
Elemi . . . . ¼ ,,
Methylated Spirit . . 1 gal.

White French Polish

In any of the foregoing substitute *White* Shellac for the ordinary variety.

Floor Polish for Ball Rooms

1. Hard Paraffin, of highest melting point . . . 1 lb.
   Spermaceti . . . 1 ,,
   Powdered Boric Acid . . 14 ,,
   Oil of Lavender . . . 1 fl. dr.
   Oil of Clove . . . 5 min.

Melt the paraffin and Spermaceti, add the Boric Acid and mix evenly. When cold, reduce to powder and sift. Add perfumes last.

2. Boric Acid, powder . . 1 lb.
   Spermaceti, powdered . . 1 oz.
   Beeswax . . . . 1 oz.
   Oil of Lavender . . . 1 fl. oz.

3. Boric Acid crystals, plain or perfumed, are sometimes used alone, but are apt to create dust.

Linoleum or Floor Polish

1. Yellow Wax . . . 3 parts
   Carnauba Wax . . . 7 ,,
   Oil of Turpentine . . 10 ,,
   Benzoline . . . . 10 ,,

Melt the two former together; when somewhat cool, add the two latter and stir. Keep away from fire or lights.

2. Linseed Oil . . . 70 parts
   Oil of Turpentine . . 15 ,,
   Terebene . . . . 5 ,,
   Essential Oil of Camphor . 5 ,,
   Kerosene . . . . 5 ,,
   Aniline Orange to colour.

3. Yellow Wax . . . 4 oz.
   Palm Oil . . . . 2 ,,
   Oil of Turpentine . . 10 fl. oz.
   Benzoline . . . . 2 ,,

4. Yellow Wax . . . 4 oz.
   Oil of Turpentine . . 2 fl. oz.
   Palm Oil . . . . 2 dr.

Polish for Motor Cars

Linseed Oil . . . 70 parts
Oil of Turpentine . . 15 ,,
Terebene . . . . 5 ,,
Essential Oil of Camphor . 5 ,,
Kerosene . . . . 5 ,,
Aniline Orange, to colour.

Liquid Grate Polish

Ceresin	12 parts
Japan Wax	10 ,,
Oil of Turpentine	100 ,,
Lampblack	12 ,,
Graphite	10 ,,

Melt the Ceresin and wax together, remove from the fire, and when half-cooled stir in the Graphite and Lampblack previously mixed with the Turpentine.

METAL POLISHES

Paste

1.	Rouge	2 oz.
	Rotten Stone	2 lb.
	Ground Silica	4 oz.
	Soft Soap	8 ,,
	Strong Solution of Ammonia	2 fl. oz.
	Water (hot)	12 fl. oz. or sufficient

Dissolve the Soap in hot water and mix with other ingredients, adding Ammonia last.

2.	Suet	3 lb.
	Kerosene	1 gal.
	Levigated Silica	30 lb.
	Oleic Acid	½ gal.
3.	Levigated Pumice	30 lb.
	Oleic Acid	1 gal.
	Japan Wax	1 lb.
4.	Levigated Tripoli	40 lb.
	Soft Paraffin	8 ,,
	Japan Wax	2 ,,
	Kerosene	1 gal.
	Oleic Acid	½ ,,
5.	Yellow Ochre (levigated)	10 lb.
	Powdered Pumice	20 ,,
	Powdered Kieselguhr	10 ,,
	Oleic Acid	1½ gal.
	Oil of Turpentine	½ ,,
	Japan Wax	3 lb.
	Kerosene	½ gal.

Liquid

1. Levigated Silica . . . 10 lb.
   Kerosene . . . . 5 gals.
   Oleic Acid . . . . 2 ,,
   Stearic Acid . . . 2 lb.

2. Powdered Kieselguhr . . 1 lb.
   Oleic Acid . . . . 1 pint
   Benzole . . . . 2 pints

Suitable for polishing gold, silver, and plated goods.

Silver Soap

Prepared Chalk . . . 45 parts
Oleic Acid . . . . 13 fl. parts

Mix and add, all at once, the following solution—

Caustic Soda . . . 2 parts
Water . . . . 15 fl. parts

Mix and form into cakes. Set on one side to harden

Silver Cleaning Liquid

1. Prepared Chalk . . . 4 oz.
   Saturated Solution of 'Hypo' 9 fl. oz.
   Solution of Ammonia ·880 . 1 ,,

2. Prepared Chalk . . . 4 oz.
   Solution of Ammonia ·880 . 1 fl. oz.
   Methylated Spirit . . 8 ,,

Polish for Aluminium

Borax . . . . 4 oz.
Solution of Ammonia . . ½ fl. oz.
Water . . . to 4 pints

Polishing Pewter

First wash with hot soap and water. Then polish with the smoothest and softest powder obtainable, *e.g.*, Rouge, Kieselguhr, or Tripoli, which has been elutriated to remove all coarse particles. Only persistent and frequent rubbing will secure a polish.

Cleaning Nickel-plated Articles

Nickel-plated articles which have become dull can readily be restored by means of Alcohol to which 2 per cent. of Sulphuric Acid has been added. The liquid is applied liberally, and after a few seconds is washed off with clean water. The surfaces are then rubbed over

with a swab dipped in fresh Alcohol, containing no acid, and finally polished with a dry cloth. This method, it is claimed, will give brilliance to the dullest piece of nickel-plating without damage. Another formula is a mixture consisting of—

Alcohol	50 parts
Sulphuric Acid	1 part
Nitric Acid	1 ,,

Plunge the article in this bath for ten or fifteen seconds, rinse it off in cold water, and dip it next into alcohol. Dry with a fine linen rag or with sawdust. Still another type of formula is the following—

Stearic acid	1 part
Ammonia ·959	25 parts
Benzin	50 ,,
Alcohol	75 ,,

Rub up the Stearic acid with the Ammonia, add the Benzin and then the Alcohol, and agitate until homogeneous.

CLEANSERS

Breeches or Clothes Ball

1. Powdered Bath Brick . 4 parts
   Pipeclay Powder . 8 ,,
   Pumice Powder . 1 part
   Powdered Soap . 1 ,,
   Ochre, Umber, or Sienna . a sufficiency
   Fresh Ox-gall (strained) to produce a stiff paste.

   Make into balls and dry.

2. Powdered Pipeclay . 4 parts
   White Fuller's Earth . 1 part
   Whiting . 1 ,,
   Fresh Ox-gall to produce a paste.

3. Powdered Pipeclay . 24 parts
   Starch Powder . 8 ,,
   Fresh Ox-gall to produce a paste.

Boot-Top Powders

Cream of Tartar	all in fine powder, equal parts
Oxalic Acid	
French Chalk	
Stannic Oxide	
Pumice	
Solution of Cochineal	sufficient to tint
Solution of Saffron	

To Clean Wireless Crystals

Flood the crystal with Methylated Spirit and brush thoroughly with a tooth brush. Afterwards rinse in clean spirit and allow to dry.

Removal of 'Fur' from the Inside of Kettles

Fill the kettle with water and add 2 oz. of Ammonium Chloride (Sal Ammoniac) for each pint of water used. Boil vigorously, replacing the water as it is lost by evaporation. The deposit will then be in a crumbly condition when it is easily removed.

To Clean Wash-Leather Gloves

Dissolve ¾ oz. best Soft Soap and 1 oz. of Castile Soap in a quart of distilled or rain water. Allow the gloves to soak in the solution for half an hour, moving them about occasionally. Lift out and allow to drain. When drippings cease place in a quart of fresh distilled or rain water and soak again. Lift out and allow to drain, and finally dry without squeezing. Freshly cleaned gloves should be put on the hands while still slightly damp.

To Clean ordinary Brown Gloves (not Suede)

Put one glove on the hand and rub it *gently* with a moistened flannel or sponge, which from time to time is rubbed on cake of hard white Castile Soap. Finish off with a clean damp cloth. Do not remove *all* the soap or the gloves will become stiff.

Glove Soap

Curd Soap	1 lb.
Water	½ ,,

Melt together and stir in—

Finely powdered Kieselguhr	2 oz.
Oil of Lavender	2 fl. dr.

Allow to set, and cut up.

Marble Cleaning Powder

Finely levigated Silica	1 part
Dried Carbonate of Soda	2 parts
Powdered Soap	½ part

Mix. Apply with a damp flannel.

Cleaning Piano Keys

It is easier to keep the keys clean than to clean them after they have become soiled. A moist piece of chamois leather round the finger serves the purpose admirably, finishing off with dry soft fabric. But in cases where the

keys have been neglected for long periods, the best procedure is first to remove grease from each key by means of a rag and Benzine and Petrol, and then apply Hydrogen Peroxide by means of a soft cloth pad, or made into a thin paste with whiting, leaving it on the keys until nearly dry. A thin paste made of unslaked lime and bran and water is also used. After bleaching, the keys should be rubbed with sifted putty powder and chamois leather.

To Clean Sponge

Soak for three hours in 1 per cent. Solution of Potash. Rinse in clean water. Soak for ten minutes in Potassium Permanganate solution kept just pink. Rinse in clean water. Decolourise by soaking in solution of ' Hypo.' Finally rinse thoroughly.

Straw Hat Cleaners

1. (A)

Hyposulphite of Soda	1 oz.
Glycerin	½ fl. oz.
Methylated Spirit	1 ,,
Water	8 ,,

(B)

Citric Acid	¼ oz.
Methylated Spirit	1 fl. oz.
Water	9 ,,

Sponge the hat well with A and place in a dark cool place for twenty-four hours. Then thoroughly sponge with B and stand for twenty-four hours.

2. Sodium Perborate.

Scrub the hat with warm water. Sprinkle some of the powder on the damp hat and brush well. Wipe clean with a damp sponge. Allow to dry in strong sunlight.

3.

Sodium Bisulphite	5 parts
Tartaric Acid	1 part
Borax	5 parts

Mix. Moisten a small quantity of the powder and apply with a toothbrush. Finish with a damp sponge ; dry.

4.

Barium Peroxide, Hydrated	10 parts
Sodium Bisulphate	2 parts
Borax	1 part

Moisten a little with water and apply.

Sweeping Powder for Floors

1.

Portland Cement	22 lb.
Mineral Oil	3 ,,

Mix well.

2.	Paraffin Wax	2 ozs.
	Kerosene	4 pints

Dissolve by heat and add to—

Salt	½ lb.
Sand	5 „
Sawdust	10 „
Oil of Spike	1 fl. oz.

3.	Paraffin Wax	2 oz.
	Liquid Paraffin	½ pint

Dissolve and add to—

Salt	2 oz.
Sawdust	2 lb.
Sand	1 „
Oil of Eucalyptus	1 fl. dr.

For carpets use these preparations with half the amount of oil.

Window Cleaning Powder

This is simply Carbonate of Soda. The powder may be made to look more mysterious by using Brunner-Mond's crystal sesquicarbonate.

Directions.—Dissolve 1 oz. in about ½ gal. of water.

Soluble Washing Powder

Dried Sodium Carbonate	10 parts
Oleic Acid	13 fl. parts

Mix and add, all at once, the following solution—

Caustic Soda	2 parts
Water	15 parts

Stir well and pour into a mould. Allow to harden and cut into bars. Shave and reduce to powder.

An alternative method is to continue the stirring until a granular mass results.

This contains about 50 per cent. Soap Powder, and makes a splendid 'Shampoo Powder.' By increasing the dried Sodium Carbonate the price may be very considerably reduced.

Scouring Soap

(Of the type of 'Monkey Brand')

Ground Silica	90 parts
Kieselguhr	10 „
Oleic Acid	13 fl. parts

Mix and add, all at once, the following solution :—

Sodium Silicate Solution	2 fl. parts
Caustic Soda	2 „
Water	15 fl. „

Stir well. Press into moulds. Dry for a week at temperature of 80° F.

This is an excellent scouring soap for pots, pans, marble, &c. The silica should pass readily through an eighty-hole sieve.

Scouring Soap-Powder

Silica Powder	60 parts
Dried Carbonate of Soda	15 ,,
Oleic Acid	13 ,,

Mix and add, all at once, the following solution –

Caustic Soda	2 parts
Water	22 ,,

Stir well until a granular powder is formed. Set on one side in shallow trays for twenty-four hours in a warm room, and reduce to about forty-hole powder.

Household Ammonia

1.	Castile Soap	1 dr.
	Solution of Ammonia, 3 %	1 pint
2.	Castile Soap	20 gr.
	Eau de Cologne Oils	5 drops
	Solution of Ammonia, 3 %	1 pint

NOTE.—The Solution of Ammonia should be made with ' tap ' water.

Paint Remover

1.	Caustic Potash	1 lb.
	Acetone	2 pints
	Methylated Spirit	1 pint
	Oil of Turpentine	1 ,,
	Petroleum Spirit	1 ,,
	Castor Oil	½ ,,

Mix. This is spread thinly over old paint. After a few minutes a second application is made, when the softened paint can generally be easily removed with a blunt knife.

2.	Solvent Naphtha	4 fl. oz.
	Furfurol to	1 pint

STAINS

Removal from Wearing Apparel, Fabrics, &c.

The following re-agents may be found useful—

Acids.—Dilute solutions of Acetic, Citric, Hydrochloric, Oxalic and Phosphoric.

Alkalies.—Dilute solutions of Ammonia, Caustic Potash and Caustic Soda ; also Potassium Cyanide.

Oxidising Agents.—Dilute solutions of Chlorinated Soda (Javelle Water), Hydrogen Peroxide, Potassium Permanganate, Sodium Perborate, Tincture of Iodine.

Reducing Agents.—Dilute solutions of Sodium Hyposulphite, Sodium Sulphite and Bisulphite, Sulphurous Acid, Dilute Hydrochloric Acid with powdered Zinc.

Solvents.—Methylated Spirit, Amyl Alcohol, Ether, Acetone, Chloroform, Carbon Tetrachloride, Carbon Disulphide, Benzine or Petrol, Benzene, Oleic Acid, Turpentine.

Before attempting the removal of a stain it is advisable to try the effect of suitable re-agents on a portion of the material, where the results of the experiment will not be too obvious in case of failure. It must be remembered that certain dyes are very fugitive, and as a rule are not improved by treatment with powerful re-agents.

Acids.—Moisten with dilute alkalies and rinse thoroughly.

Blood.—Soak in several lots of tepid water. Apply Hydrogen Peroxide or Javelle Water. Soak in ' hypo ' solution and rinse thoroughly.

Coffee.—Soak in warm water and apply Hydrogen Peroxide or Javelle Water. After the latter, soak in ' hypo ' solution and rinse thoroughly.

Condy's Fluid.—See Permanganate of Potash.

Cream and Ice Cream.—Wash with soap and tepid water to remove the fat. If coloured, apply Javelle Water, soak in ' hypo ' solution and rinse thoroughly.

Dyes.—Soak in Methylated Spirit containing alternately dilute alkali and dilute acid. Apply alternately oxidising and reducing agents. Rinse very thoroughly.

Egg.—Treat as for cream.

Fruit.—Hydrogen Peroxide or Javelle Water. If the latter is used soak in ' hypo ' solution and rinse thoroughly.

Grass.—First try soaking in a mixture of methylated Spirit and Ether. If this is not successful try Hydrogen Peroxide or Javelle Water. If the latter is used, soak lastly in ' hypo ' solution and rinse thoroughly.

Grease.—If a large surface, extract by treatment with any of the ' solvents ' mentioned above.

If only small spots, cover the spots with fine whiting. Then make a ring of solvent at some considerable distance from the spots. Keep this ring of solvent all the time. Lastly, drop solvent on the whiting. As the solvent

evaporates it will drive the grease into the whiting. Repeat if necessary.

If solvent is applied *directly* to the grease spot it dilutes the grease and spreads it over the fabric. Grease stains can be removed from marble and paper in the same way.

Ink.—Apply solution of Oxalic Acid. If not successful, apply alternately, solution of Ammonia and dilute Phosphoric Acid.

The ink may contain a dye. After the above treatment apply Javelle Water, soak in ' hypo ' solution and rinse thoroughly. Finally, place the moist fabric in strong sunlight.

Iron.—Treat as for Ink.

Mercury Stain on Gold.—Make a paste of precipitated Silica and Tincture of Iodine, and rub the spot vigorously. Soak in Potassium Iodide solution, water and finally polish.

Mildew.—Treat alternately with Javelle Water and Oxalic Acid solution, soak in ' hypo ' solution and rinse thoroughly.

Paint.—Soak in a mixture of Turpentine, Chloroform and Oleic Acid for some time. Finally wash with soap and water.

Permanganate of Potash.—Soak in solution of Oxalic Acid, afterwards rinsing thoroughly.

Perspiration.—Wash with strong soapy water. Rinse successively with dilute Acid, dilute Alkali and Hydrogen Peroxide solutions. Rinse and expose to sunlight.

Rust.—Treat as for ink.

Scorch.—Soak alternately in dilute Oxalic Acid solution and Javelle Water. Soak in ' hypo ' solution and rinse thoroughly.

Silver.—Soak in Potassium Cyanide solution and rinse. Remember, this solution is intensely poisonous.

Tar.—Try the various ' solvents ' mentioned, finally washing with soap and water.

Tobacco.—Treat as for Paint.

Varnish. Treat as for Paint.

Walnut.—Try successively, Javelle Water, Oxalic Acid, Hydrogen Peroxide and ' hypo ' solution. Use the 'hypo' last and rinse thoroughly. Expose the moist fabric to strong sunlight.

Wax.—Place clean blotting paper over the spots and apply a hot iron. Repeat as often as necessary. The last traces may be removed with one of the 'solvents' mentioned.

LAUNDRY PREPARATIONS

Laundry Blue

Ultramarine Blue	18 lb.
Carbonate of Soda, dried	15 ,,
Glucose	3½ ,,
Water	sufficient to make into a mass

Mix well, cut into cakes or squares, and dry at 70° F.

Liquid Laundry Blue

Oxalic Acid	8 oz.
Prussian Blue	16 ,,
Boiling Water	6 gals.

Strain.

Soluble Prussian Blue

Best Prussian Blue	2 parts
Potassium Ferrocyanide	1 part

Rub together to a very fine powder, and add from 100 to 200 parts of distilled water according to strength of colour required. Shake occasionally for an hour, and filter.

Liquid Cold-water Starch

Sago Flour	10 lb.
White Dextrin	2 ,,
Salt	4 ,,
Glycerin	2 ,,
Water	13 pints

Cold-water Starch and Gloss

Sago Flour	22 lb.
Rice Starch	9 ,,
Dried Salt	6 ,,
Powdered Borax	6 ,,
White Dextrin	6 ,,

Make sufficient of the powder into a paste with cold water, and then pour on boiling water until of required consistence. Do not boil.

Wax Polish for Linen

Stearic Acid	. . .	1 lb.
White Wax	. . .	2 ,,
Spermaceti	. . .	4 ,,

Melt together and pour into cakes.

Directions.—After the linen has been made hot by ironing, rub lightly with the cake and finish with a polishing iron.

Starch Glaze Powder

1.

Powdered Borax	. .	42 lb.
Potato Starch	. . .	16 ,,
Salt . . .	. . .	14 ,,
White Dextrin	. . .	3 ,,

Mix. One ounce to be mixed with two pints of ordinary starch.

2.

Powdered Castile Soap	.	½ oz.
Borax . . .	.	¼ ,,
French Chalk	. . .	4 ,,
Hard Paraffin	. . .	1 dr.

Dissolve the Paraffin in a very little warm Petroleum Ether. Pour on to the mixed powders, and triturate thoroughly until the spirit has evaporated and a uniform powder results.

Directions.—Dust the linen with the powder from a fine dredger, rub lightly with cotton wool, and iron.

INKS

NOTE.—Gall Inks, as a rule, require some time for the development of the colour, but once the change has taken place the ink is almost permanent. Although old writing may appear brown and faded, by proper treatment it may be made quite legible.

Logwood inks, on the other hand, turn black almost at once, but in course of time the colour changes and is not capable of being restored. Logwood inks, therefore, are not considered suitable for documents, &c., that may require to be kept for any length of time.

Colours for 1 gal. of Gall ink :

Green-Black Ink.—Aniline Green D, ½ oz.

Violet-Black Ink.—Methyl Violet, ¼ oz.; Phenol Blue and Ponceau Red, of each 60 gr.

Red-Black Ink.—Ponceau Red R, ½ oz.

Blue-Black Ink

1.

Sound Aleppo Galls, *bruised in a stone mortar*	. .	4 oz.
Bruised Cloves	. .	¼ ,,
Distilled Water (cold)	. .	2 pints

Macerate for a week, shaking occasionally. Strain, press (not an iron press), and filter. Add—

Ferrous Sulphate	. . 1½ oz.
Neutral Indigo Carmine Powder	40 gr.

Keep for at least a month, shaking occasionally before use.

NOTE.—Methyl Blue 30 gr. may be substituted for the Indigo Carmine.

2. Chinese Galls are used in this ink. The fermenting process must on no account be curtailed.

Chinese Galls, coarsely ground 7 oz.

Thoroughly moisten with distilled water, and keep at a temperature of about 80° F. for eight or ten days, or until the surface is quite covered with mould. The mass must be kept damp.

Add 1 pint of water and heat on water bath for one hour, strain, and press in *wooden* press. Digest with about ½ pint more water for another hour and press as before. The product, which should measure 2 pints, is filtered bright by means of Kieselguhr. Add—

10 per cent. Solution of Ferric Chloride	3½ oz.
Methyl Blue	30 gr.
Oil of Clove	10 min.

3. | | |
|---|---|
| Tannic Acid | 9 oz. |
| Distilled Water | 4 pints |

Dissolve by gentle heat, cool, and add—

Ferric Chloride	2½ oz.
Distilled Water	½ pint

Keep for a month, shaking occasionally. Add—

Sugar	1 dr.
Mucilage of Acacia	1 fl. dr.
Methyl Blue	1 dr.

previously dissolved in 3½ pints distilled water. Shake well for a week, then stand for a month before use.

4. | | |
|---|---|
| Tannic Acid | 9 oz. |
| Distilled Water | 9 fl. oz. |
| Stronger Solution of Ferric Chloride (B.P.) | 3¼ ,, |
| Hydrochloric Acid | ¾ ,, |

Heat in earthenware vessel over a water bath for six hours. Add sufficient warm distilled water to make the product measure ¾ gal. Filter and add—

Methyl Blue	2½ dr.
Carbolic Acid	2 ,,
Sugar	1 ,,
Distilled Water to make	1 gal.

Keep for a month in the dark before use.

5.

Tannic Acid	2¼ oz.
Gallic Acid	¾ ,,
Ferrous Sulphate	3 ,,
Dilute Hydrochloric Acid	2½ fl. oz.
Carbolic Acid	75 gr.
Methyl Blue	¼ oz.
Distilled Water to	5 pints

Dissolve the Tannic and Gallic Acids in about 5 oz. of warm water. Cool. Dissolve the Ferrous Sulphate in about 15 oz. of cold water. Add the Hydrochloric Acid and immediately mix the two solutions.

Add the Carbolic Acid, Methyl Blue, and sufficient water to make the product 5 pints.

6. The official German standard ink is the formula by Schluttig and Neumann, and has been adopted by the Commonwealth of Massachusetts, U.S.A., for use on State records. If 2·0 of Phenol Blue FFF be added, a black ink results which leaves little to be desired. The formula is :

Tannic Acid	23·4
Gallic Acid	7·7
Ferrous Sulphate	30·0
Gum Arabic	10·0
Dilute Hydrochloric Acid (10 per cent. HCl)	25·0
Phenol	1·0
Water to make	1,000·0

Coloured Inks

Red Ink

Carmine	4 gr.
Gum Acacia	6 ,,
Solution of Ammonia	a sufficiency
Distilled Water to	1 fl. oz.

Green Ink

Cupric Acetate	4 dr.
Potassium Carbonate	2 ,,
Distilled Water	16 fl. dr.

Boil until reaction is complete and make up to 2 fl. oz.

Blue Ink

Prussian Blue	3 dr.
Oxalic Acid	1 dr.
Distilled Water	4 fl. oz.

Dissolve and add—

Gum Acacia	40 gr.

White Ink.—Finely ground Zinc Oxide made into a thin cream with mucilage.

Gold Ink.—Rub gold leaf to smooth paste with Glycerin. Boil with water and allow the gold to deposit. Decant the diluted Glycerin. Wash once with water. Mix the finely divided gold with mucilage and a trace of Water Glass. The ink may be polished by rubbing with any smooth ivory instrument.

Silver Ink.—Made from silver leaf in a manner similar to gold ink.

Metallic Inks, other than the two above, may be made from aluminium bronze and other bronze powders.

Copying Ink

Any of the formulas for gall or tannic acid inks will furnish a good copying ink by adding to each gallon—

Mucilage of Acacia	2 fl. oz.
Glycerin	2 ,,

If several copies are to be taken, the ink must be made 1½ times the usual strength.

Cheap Logwood Copying Ink

Logwood Extract	35 parts
Boiling 5 per cent. Acetic Acid	1,000 ,,

Dissolve and add—

Ferrous Sulphate	20 parts
Alum	10 ,,
Acacia	15 ,,
Sugar	30 ,,
Glycerin	2 ,,

Silver Marking Ink

Silver Nitrate	700 gr.
Distilled Water	10 fl. gr.

Dissolve.

Sodium Carbonate Crystals	1,000 gr.
Distilled Water	10 fl. oz.

Dissolve. Filter.

Mix the solutions, collect precipitate on calico filter, and wash free from nitrates. Squeeze precipitate and add—

Tartaric Acid	245 gr.

When effervescence ceases add—

Solution of Ammonia, sp. gr. ·880	3 fl. oz.

Next mix—

Powdered Acacia	800 gr.
Powdered Sugar	500 ,,
Water-soluble Chlorophyll Paste	60 ,,

To this gradually add the Silver Mixture, stirring constantly. Strain through muslin and make up to ½ pint with distilled water.

Aniline Marking Ink

1.	Copper Chloride Crystals	8½ oz.
	Sodium Chlorate	10½ ,,
	Ammonium Chloride	5¼ ,,
	Distilled Water	3 pints
2.	Aniline Hydrochloride	10 oz.
	Distilled Water	15 fl. oz.

Dissolve and add—

Mucilage of Acacia	10 fl. oz.
Glycerin	4 ,,

When required for use mix 1 part of No. 1 with 4 parts of No. 2.

After writing, expose to the air for twenty-four hours, when the writing will turn black. Do not apply any heat. This is a first-class formula.

Indestructible Marking Ink

1. Rub a stick of really good Chinese ink with water until a rich liquid is produced. Write with either a quill or steel pen. Soon after writing apply a hot flat-iron. The finely divided carbon particles become indelibly fixed in the fibres, and are unaffected by acids, alkalies, and bleaching powder. The result is not black, but it is absolutely permanent.

2. Grind fine Chinese ink with water until a thick liquid is obtained. Dry and powder. To this add a mixture of Coal Tar in Solvent Naphtha (1 in 2). It is absolutely indelible and does not rot the fabric.

Blue Marking Ink

Silver Nitrate	1 oz.
Solution of Ammonia	3 ,,
Sodium Carbonate	1 ,,
Powdered Acacia	1½ ,,
Copper Sulphate	5 ,,
Distilled Water	4 ,,

Dissolve the Silver Nitrate in the Solution of Ammonia. Dissolve the Copper Sulphate in the distilled water and mix with remaining ingredients. Mix the two solutions.

Red Marking Ink

Beat fresh egg Albumen with an equal weight of water and filter through calico. Mix the filtrate with sufficient finely powdered Vermilion to make a thin cream.

Write with a quill, and then apply a hot flat-iron to the back of the material, when the albumen will be fixed and the ink rendered indelible.

Coloured Inks for Rubber Stamps

Black

Black Aniline Dye	3 oz.
Water	10 fl. oz.
Acetic Acid, 90 per cent.	1 fl. oz.
Industrial Alcohol	12 ,,
Glycerin	to 4 pints

Red

Red Aniline Dye	3 oz.
Water	12 fl. oz.
Industrial Alcohol	12 ,,
Glycerin	to 4 pints

Violet

Violet Aniline Dye	2 oz.
Water	10 fl. oz.
Acetic Acid, 90 per cent.	1 ,,
Industrial Alcohol	12 ,,
Glycerin	to 4 pints

Green

Green Aniline Dye	2 oz.
Water	10 fl. oz.
Acetic Acid, 90 per cent.	1 ,,
Industrial Alcohol	12 ,,
Glycerin	to 4 pints

Hectograph Ink

Methyl Violet	1 part
10 per cent. Alcohol	10 parts

Dissolve.

Typewriter-ribbon Ink

1.

Soft Soap	1 oz.
Glycerin	3½ oz. by weight
Distilled Water	12 ,, ,,
Industrial Alcohol	25 ,, ,,
Methyl Violet	½ ,, ,,

Mix and filter.

2. Oleic Acid . . . . 45 parts
Oil-soluble Aniline Red . 15 ,,
,, Bordeaux Red . 15 ,,
Castor Oil to make . . 1,000 ,,

Heat to 212° F. for half an hour.

Aniline Copying Ink

Aniline Blue . . . 60 gr.
Alum . . . . 25 ,,
Glycerin . . . . 2 fl. oz.
Distilled Water to . . 1 pint

Duplicating Ink

Methyl Violet . . . 10 parts
Barium Sulphate (pure) . 30 ,,
Liquid Paraffin . . . 35 ,,
Soft Paraffin . . . 115 ,,

Dissolve the Methyl Violet in hot Methylated Spirit (boil two or three times); pour the solution on to the Barium Sulphate, and dry on water-bath. Grind to *fine* powder, preferably in a mechanical mortar, add the Liquid Paraffin, continue the grinding, then add the Soft Paraffin.

Dull-Surface Ink for Showcards

To aqueous solutions of suitable Aniline Dyes add 10 per cent. of a solution prepared as follows:

Borax . . . . $\frac{1}{4}$ oz.
Water . . . . 5 ,,

Dissolve and add—

Shellac . . . . $\frac{1}{4}$,,

Dissolve by aid of a gentle heat, stirring well all the time. The ordinary tube water-colours, suitably thinned with water, may be treated similarly, but the former method ensures flatness of surface, and is waterproof.

Glossy Ticket-Writing Ink, &c.

A vehicle suitable for the production of any coloured ink suitable for showcards may be made by dissolving Borax, $\frac{1}{2}$ oz., in water, 5 oz., and adding Sodium Silicate 1 oz. and Shellac, $\frac{1}{4}$ oz., which must be dissolved by aid of heat. With this any dry pigment, or moist colour in tubes, may be mixed, or an aniline dye may be dissolved in it. A black may be obtained by adding to the above vehicle Nigrosin, 60 gr.; tannin, 20 gr.; Picric Acid, 8 gr.; Solution of Ammonia, 2 fl. dr. A bright red may be obtained by adding sufficient

of the above vehicle to moist water-colour Vermilion. Water-glass is often used as the vehicle for the various moist colours, and it produces a glossy surface. A little Gum Acacia is sometimes added to the Borax-Shellac solution.

Black Ink for Leather

Extract of Logwood . .	5 parts
Yellow Chromate of Potassium	0·6 part
Brilliant Black, B . .	1 ,,
Anhydrous Ferrous Sulphate	30 parts
Copper Sulphate. . .	5 ,,
Distilled Water . . .	450 ,,

Dissolve the extract in water, 200, by the aid of heat, then add the Chromate and the Brilliant Black. When these have dissolved, allow the liquid to cool. Meanwhile dissolve the Ferrous and Cupric Sulphate in hot water, 250. Mix the two liquids; allow to stand for eight days and then decant.

Ink for Writing on Glass

Pale Shellac . . .	2 oz.
Venice Turpentine . .	1 ,,
Sandarac	¼ ,,
Oil of Turpentine . .	3 fl. oz.

Dissolve by gentle heat, and add—

Lampblack . . .	½ oz.

Mix.

For Blue Ink use Powdered Ultramarine.

For Green Ink use Brunswick Green.

For Red Ink use Vermilion.

Fugitive Ink

Arrowroot	25 gr.
Distilled Water . . .	¼ pint

Boil gently for fifteen minutes, making up the water lost by evaporation. Filter through coarse paper when cold, and to each ounce add not more than 3 drops of Tincture of Iodine B.P.

Write with a quill pen. The writing disappears in two or three days.

Invisible, or Sympathetic Ink

1.	Cobalt Chloride . . .	40 gr.
	Mucilage of Acacia .	20 min.
	Distilled Water to .	1 fl. oz

Write with quill pen and allow writing to dry. On warming the paper the writing becomes visible, and disappears again when it becomes cold.

2.	Lead Acetate . . .	30 gr.
	Distilled Water . . .	1 fl. oz.

The writing, which is invisible when dry, becomes apparent when the paper is damped with Sulphuretted Hydrogen solution or exposed to the fumes of the gas.

3.	Potassium Ferrocyanide .	20 gr.
	Distilled Water . . .	1 fl. oz.

To make the writing visible, damp with solution of Ferric Chloride.

Stencil Inks

Garnet Shellac . . .	1 lb.
Borax	1 ,,
Water	1 gal.

Boil together until solution is effected ; add—

Hard Soap. . . .	1 oz.
Gum Arabic . . .	4 ,,

Evaporate till the product measures ½ gal.

For use make into a rather thick paste with any of the following colours :

Black

(*a*) Lampblack.

Red

(*b*) Bole	7 parts
Vermilion	1 part

Blue

(*c*) Ultramarine . . .	1 part
Zinc Oxide . . .	1 ,,

For Marking Packages

Extract of Logwood . .	18 oz.
Copper Sulphate. . .	36 ,,
Gum Arabic . . .	4 ,,
Water	3 gal.

Boil together for half an hour. Product should be about 2¾ gal. Add—

Bichromate of Potassium .	3 oz.

For Sacks

Rosin	1½ lb.
Shellac	10 oz.
Lampblack . . .	1¼ lb.
Methylated Spirit . .	2½ pints

Ink for Stamping (Oily)

Basis.—Expose *cold-drawn* Linseed Oil in shallow trays, protected from the dust, until a pellicle forms on the surface. Break this and pour off the clear oxidised oil. To each ounce add 9 oz. of Olive Oil.

The colours must be ground in by hand with a muller or in a suitable mill. Those commonly used are—

Brunswick Green
Ultramarine
Orange Chrome
Vermilion
Lampblack

Oil-soluble Aniline Dyes may be in part or wholly substituted for the above. They must first be warmed with Oleic Acid, triturating until smooth, the Linseed-Olive mixture being added by degrees. The temperature should not greatly exceed blood-heat.

Ink for Writing on Steel

Copper Sulphate	¼ oz.
Sulphuric Acid	5 min.
Pyrogallic Acid	5 gr.
Water to	1 fl. oz.

Use a copper pen.

Ink for Writing on Sheet Tin

Shellac	2 oz.
Methylated Spirit	1 pint

Dissolve and filter bright through Kieselguhr to remove wax. Add—

Finest Lampblack	2 oz.

This gives a *dead* black. Shellac in Turpentine gives a *glossy* black.

Indelible Ink for Writing on Paper

Potassium Ferrocyanide	3 parts
Strong Solution of Ammonia	2 ,,
Tartaric Acid	2 ,,
Distilled Water	240 ,,

Dissolve and filter. Add—

Ammonio-Citrate of Iron	160 parts
Solution of Ammonia	40 ,,
Aniline Blue	8 ,,
Mucilage of Acacia	15 ,,

This gives a dark blue ink. By adding—

Pyrogallic Acid	20 ,,

to the above a black ink is produced.

Crayons for Writing on Glass

Spermaceti	4 oz.
Tallow	3 ,,
Beeswax	2 ,,
Red Lead, in fine powder	6 ,,

Melt, mix, and while hot add—

Boiling Saturated Solution of Caustic Potash	1 fl. oz.

Keep warm for half an hour, stirring occasionally. Pour into moulds.

The glass must be clean and dry.

LABEL PASTES, ETC.

1.

Tragacanth Powder	1 oz.
Dextrin	1 ,,
Wheat Flour	6 ,,
Gum Arabic Powder	2 ,,
Salicylic Acid	1 dr.
Water	2 pints

Mix the powders intimately ; add, all at once, half the water ; make an even mixture, and pour in a thin stream into the remainder of the water heated to boiling in a suitable vessel.

2.

Wheat Flour	1 lb.
Powdered Alum	1 oz.
Cold Water	4 pints

Mix, strain through sieve, and heat to boiling for not less than five minutes. Cover while cooling. Add, when cold—

Oil of Clove, Carbolic Acid	of each	30 min.

3.

Wheat Flour	8 oz.
White Dextrin	12 ,,
Cold Water	4 pints
Oil of Clove, Carbolic Acid (of each)	30 min.

Mix as directed for No. 2.

4.

Wheat Flour	½ lb.
Alum	1 dr.
Boric Acid	1 ,,
Water	½ pint

Make a smooth paste and add—

Acetic Acid	1 fl. oz.
Water	1 pint

Mix; heat with constant stirring until sufficiently gelatinous. If too stiff, add more water. When nearly cool add—

Oil of Clove	20 drops

Professional's Photo-Mountant

1. Most professional mounters use pure starch paste (say, four times the strength of starch mucilage B.P.).

It must be made freshly every morning, but it has the great advantage of being *absolutely safe*, and once the paste is dry the photos may be considered fixed for all time.

2. Dextrin	1 lb.
Distilled Water	1¼ pint
Oil of Clove	1 fl. dr.

Mix the Dextrin and water until perfectly smooth, maintaining the temperature as nearly as possible at 160° F. The product should be quite clear. Add the Oil of Clove, stir well, pour into bottles and cork. Set aside for a few days to gelatinise. If too thick for any purpose thin slightly with water.

Liquid Glue

Slaked Lime, in fine powder.	½ oz.
Sugar	2 ,,

Mix and add enough water to produce about 6 fl. oz. Keep at temperature of about 150° F. for several hours, stirring occasionally. Stand until separated. Filter off as much as possible, and in each 5 parts of the filtrate dissolve, by gentle heat, 1 part of good glue.

The solution remains fluid on cooling, and retains all the original adhesive properties of the glue.

SEALING WAX

Black

1. Venice Turpentine	4½ parts
Shellac	9 ,,
Resin	1 part
Lampblack	a sufficiency
2. Resin	6 parts
Shellac	2 ,,
Venice Turpentine	2 ,,
Lampblack	a sufficiency
3. Shellac	8 parts
Venice Turpentine	3 ,,
Ivory Black	2½ ,,

Blue

1. Shellac . . . . 2 parts
   Dammar . . . . 2 ,,
   Burgundy Pitch . . . 1 part
   Venice Turpentine . . 1 ,,
   Ultramarine . . . 3 parts
2. Venice Turpentine . . 3 parts
   Shellac . . . . 7 ,,
   Resin . . . . 1 part
   Prussian Blue . . . 1 ,,
   Magnesium Carbonate . . $\frac{1}{6}$,,

Brown

1. Venice Turpentine . . 4 parts
   Shellac . . . . 8 ,,
   Magnesium Carbonate . . $\frac{1}{4}$ part
   Brown Umber . . . $\frac{1}{2}$,,
   Vermilion . . . . $\frac{1}{2}$,,
   Prepared Chalk . . . $\frac{1}{2}$,,
2. Venice Turpentine . . 4 parts
   Shellac . . . . 8 ,,
   Umber . . . . $1\frac{1}{2}$,,
   Magnesium Carbonate . . $\frac{1}{6}$ part

Green

Venice Turpentine . . 2 parts
Shellac . . . . 4 ,,
Resin . . . . 1 part
King's Yellow . . . $\frac{1}{2}$,,
Prussian Blue . . . $\frac{1}{4}$,,
Magnesium Carbonate . . $\frac{1}{6}$,,

Gold

Venice Turpentine . . 4 parts
Shellac . . . . 8 ,,
Bronze Powder . . . 1 part
Magnesium Carbonate . . $\frac{1}{6}$,,

Red

Shellac . . . . 8 parts
Venice Turpentine . . 5 ,,
Vermilion . . . . 11 ,,
Magnesium Carbonate . . $\frac{1}{6}$ part

Cheap 'Bottle' Wax

Resin . . . . 16 parts
Beeswax . . . . 2 ,,
Hard Paraffin . . . 1 ,,
Venice Turpentine . . 2 ,,
Vermilion . . . . 1 ,,
Bole . . . . . 1 ,,

CEMENTS

Gelatin	5 oz.
Water	4 fl. oz.

Allow to soften, dissolve on water bath, and add—

Glacial Acetic Acid	10 fl. dr.
Oil of Clove	30 min.

Casein Cement

Casein (fresh as possible)	10 oz.
Quicklime	1 ,,
Oil of Clove	20 min.

Make into paste with water and apply quickly. Will mend almost anything, but surfaces must be clean and afterwards bound tightly together.

Transparent Cement

White Caoutchouc, in shreds	5 parts
Chloroform	5 ,,

Dissolve in the cold and add—

Mastic	1 part

Stir occasionally until dissolved.

This gives a perfectly colourless cement, well adapted for mending glass, china, &c.

Rubber Cement

The following cement may be called 'Chemical Vulcanising,' since there is a real chemical combination between the ingredients. The formula is as follows :

Pure Raw Rubber	57 oz.
Rosin	14 ,,
Gutta Percha	5 ,,
Carbon Disulphide	4 pints
Benzene	1 gal.

Cut the rubber into shreds and dissolve in the benzene, then add the crushed rosin, and dissolve it also. Dissolve the gutta percha in the Carbon Disulphide, add the rubber-rosin solution and mix well. This is the cement, but it must be used with the solution that carries it into the substance of the article to be patched, and forms a real chemical union ; the solution in question is as follows : Sulphur Chloride, 180 grains ; Carbon Disulphide, sufficient to make 2 pints. Clean the surfaces to be joined with sandpaper and petrol or alcohol, then apply

a coat of the cement to both surfaces ; allow to stand a few minutes until the glossy appearance disappears. Then with a small, thin brush just moisten the surfaces with the solution, and at once fit them together and allow to dry. The cement will soon dry, and the tyre or other object may be used, but it is much better to wait until the liquid has had time to exert its action, which will require anything from six to twenty-four hours, depending on temperature, pressure, and other conditions.

Glycerin Cement

Litharge, finely ground	5 oz.
Glycerin, 5 volumes Water, 2 volumes	6 fl. oz.

Sets hard in ten minutes. Useful as a luting for joints. Resists strong acids and ammonia, but is attacked by acetic acid and caustic alkalis.

Acid-proof Cement

1. Asbestos, in fine powder	2 parts
Barium Sulphate	3 ,,
Sodium Silicate	2 ,,

Mix. Takes several hours to set.

If Potassium Silicate is used, the mixture sets almost immediately.

2. Finely Powdered Glass	4 oz.
Sodium Silicate	a sufficiency.

Make into a paste. The glass must be in the form of ' flour.'

Water-proof Cement

Zinc Oxide, fine powder.
Strong Solution of Zinc Chloride.

Make a cream. If it is desired to delay the setting a little Ammonium Chloride should be dissolved in the Zinc Chloride solution.

Acacia Cement

Calcium Nitrate	2 parts
Powdered Acacia	20 ,,
Water	25 ,,

Rub together. The product is a most tenacious mucilage.

Quick-drying Cement for Capping

Resin	½ lb.
Acetone	¾ pint
Flexible Collodion	12 fl. oz.
Aniline Red	a sufficiency

Cement for Cue Tips

Isinglass	1 oz.
Water	2 fl. oz.
Glycerin	1 fl. dr.
Glacial Acetic Acid	1 fl. oz.

Cement for Indiarubber

Gutta Percha	5 dr.
Caoutchouc	10 ,,
Fish Glue	2½ ,,
Carbon Bisulphide	5 fl. oz.

Shave off the oxidised ends or surfaces, apply a thin layer of the cement, allow to evaporate until slightly tacky, and bind firmly together.

Cement for Ivory

Isinglass,
Sheet Gelatin . . . equal parts.

Allow to soften in water. Squeeze out excess of water and stir in 1 per cent. of Mastic Varnish. Warm before use.

Cement for Knife Handles

Sublimed Sulphur	1 oz.
Powdered Resin	2 ,,
Silica	1 ,,

The tang of the knife must be heated to a dull redness.

Cement for Meerschaum

Mix Casein powder with sufficient Sodium Silicate solution to produce a soft paste, add a little light Calcined Magnesia, smear edges to be united, and bind tightly together.

Cement for Metal Letters

Mastic	1 oz.
Linseed Oil	3 ,,

Heat until homogeneous. Add—

Finely Powdered White Lead	1 oz.
Finely Powdered Litharge	3 ,,

Heat and stir until evenly mixed. Cement and letters must be quite warm.

Cement for Pestle Handles

Shellac,
Gutta Percha,
Rosin . . . . equal parts

Melt together. The parts to be cemented must be dry and warm.

Cement for Rubber Soles and Shoes

1. Mix 10 parts of Carbon Disulphide with 1 part of Oil of Turpentine, and then add enough Gutta-percha to make a tough, thickly-flowing liquid. The surfaces must of course be perfectly free from grease.

2. Cut 30 parts of Rubber into small pieces, and dissolve it in 140 parts of Carbon Disulphide. Then melt 10 parts of Rubber with 15 of Colophony, and add 35 parts of Oil of Turpentine. The two solutions to be mixed for use.

Cement for Tortoiseshell

1. Shellac	30 parts
Mastic	10 ,,
Alcohol, 90 per cent. .	125 ,,
Turpentine . . .	2 ,,

2. Canada Balsam (baked to get rid of volatile matter) dissolved in the smallest quantity of Chloroform.

Cement for Vulcanite

It is doubtful if there is any solvent that would act as a cement for Vulcanite. It is better to use a preparation made by melting together equal parts of Gutta-percha and Asphaltum, applying the cement hot, pressing the pieces together, and keeping them in place until cold. Marine Glue also answers. Caoutchouc, 1, is dissolved in benzol, 12 ; Powdered Shellac, 20, is then added to the solution, and the mixture carefully heated. A cement specially made for Vulcanite is as follows : Dissolve 1 part of Sulphur and 3 parts of pure Caoutchouc in 6 parts of Alcohol and 100 parts of Carbon Disulphide, and evaporate to the consistence of a thin paste. Join the two edges with this, and heat the whole to about 310° F. for four hours.

HORTICULTURAL PREPARATIONS

ARTIFICIAL MANURES

By the Fertilisers and Feeding Stuffs Act, 1893, *a warranty, in the form of an invoice stating the name and composition of the article, must be given to the purchaser.*

1. Sodium Phosphate . . 4 oz.
   ,, Nitrate . . . 4 ,,
   Ammonium Sulphate . . 2 ,,
   Sugar . . . . 1 ,,

   Mix. Two teaspoonfuls to a gallon of rain-water.

2. Calcium Phosphate . . 4 oz.
   Saltpetre . . . . 1 ,,
   Potassium Phosphate . . 1 ,,
   Magnesium Sulphate . . 1 ,,
   Ferric Phosphate . . ¼ ,,

   Mix. A general fertiliser.

3. Ammonium Sulphate . . 10 oz.
   Sodium Nitrate . . . 15 ,,
   Ammonium Phosphate . 30 ,,
   Potassium Nitrate . . 45 ,,

4. Rape Dust. . . . 4 lb.
   Basic Slag . . . . 5 ,,
   Bone Flour . . . 1 ,,
   Potassium Nitrate . . 2 ,,

A good general fertiliser. About 4 ounces per square yard for top dressing.

Top Dressing for Perennials

In November

Basic Slag . . . . 4 lb.
Potassium Sulphate . . 1 ,,

In March

Superphosphate . . . 4 lb.
Ammonium Sulphate . . 1 ,,

Sufficient for 40 square yards.

Top Dressing for Roses

Ammonium Sulphate . . 2 lb.
Superphosphate . . . 8 ,,

Sufficient for 40 square yards. Apply in Spring.

Liquid Manure for Roses

Potassium Nitrate . .	1 oz.
Potassium Phosphate . .	1 ,,
Water	1 gallon

Fertilisers for Lawns

Many grasses, particularly Bents and Fescues, flourish in acid soil. Practically all weeds require an alkaline soil for development. A slightly acid soil should be aimed at, when weeds will gradually die out while grasses are encouraged. A combined fertiliser that will bring this about is :

Ammonium Sulphate . .	25 lbs.
Calcium Superphosphate .	40 ,,
Coml. Potassium Chloride .	25 ,,
Fine Sand	10 ,,

Mix and apply about 2 ounces to the square yard, washing it in with a hose. If water is not available the fertiliser must be sprinkled on when the grass is dry, and the powder will slip down between the blades.

Special Treatment of Tennis Lawns

In November.—Sprinkle with a mixture of Basic Slag, 3 lb., Kainit, 2 lb., using this quantity for every 40 square yards. If weather is dry, wash in with water.

In March.—Sprinkle with a mixture of Calcium Superphosphate, 2 lb., Ammonium Sulphate, $\frac{3}{4}$ lb., using this quantity for every 40 square yards. Wash in if weather is very dry.

Weed Destroyer or Lawn Sand

Green Vitriol, dried . .	75 lb.
Crude Sulphate of Ammonia.	25 ,,
Fine Sand	25 ,,

Sprinkle thinly on the patches of weeds and leave for two days, then wash in with a hose. The compound rests on flat leaves, which are blackened and destroyed, but slips off the vertical grass blades.

INSECTICIDES

1. Creosote (Wood) . . . 1 fl. oz.
   Concentrated Infusion of Quassia (1 to 7). . . 17 ,,
   Methylated Spirit to produce a clear solution (about 2 or 3 fl. oz.).

Directions.—Two tablespoonfuls to a gallon of water (or less) kills green fly, &c., and does not injure the plants. Syringe with fresh water next day.

2. Crude Nicotine . . . 1 dr.
Soft Soap . . . 1 lb.
Extract of Quassia . . 1 oz.
Kerosene . . . . 1 pint
Methylated Spirit to . . 1 gal.

Two or three tablespoonfuls to a gallon of water kills green fly, &c. Apply overnight, and syringe well with fresh water next morning.

3. Soft Soap . . . . 7 lb.
Quassia . . . . 7 ,,
Water . . . . 100 gals.

Boil the Quassia with several lots of water until exhausted. Dissolve the Soap in more hot water. Mix the solutions and dilute to 100 gals.

Ant Poison

1. Aloes . . . . ½ lb.
Potassium Carbonate . . 1 oz.
Creosote . . . . 1 fl. oz.
Water . . . . 1 gal.

2. Naphthalene . . . 1 oz.
Kerosene . . . . 4 fl. oz.
Creosote . . . . 1 oz.

Melt together, and add to—

Soft Soap . . . ¼ lb.
Water . . . . 1 pint

previously dissolved. Well mix, and add to sufficient water to produce 1 gal.

3. Quassia . . . . 10 lb.

Thoroughly extract by boiling with sufficient water to produce 50 gals. In this dissolve—

Soft Soap . . . . 4 lb.

Gradually add, with frequent stirring—

Kerosene . . . . 1 pint
Creosote . . . . ¼ ,,

FUNGICIDES

Bordeaux Mixture

Copper Sulphate . . . 10 oz.
Quicklime . . . 6 ,,
Water . . . . 5 gal.

Dissolve the Copper Sulphate in 1 gallon hot water and pour into a wooden or enamelled vessel containing 3 gal-

lons of water. Mix the quicklime with 1 gallon water, stir well for about half an hour and mix with the copper solution.

Burgundy Mixture (Concentrated)

A.	Copper Sulphate	5 oz.
	Water	2¼ pints

Dissolve.

B.	Sodium Carbonate, crystals	6 oz.
	Water	1 pint

Dissolve and add—

Strong Solution of Ammonia	7½ fl. oz.

Mix Solutions A and B and add sufficient water to produce 5 pints. For use dilute 1 part with 12 parts of water.

Wye Mixture (Concentrated)

A.	Copper Sulphate	1 lb.
	Water	4 pints

Dissolve.

B.	Slaked Lime	1 lb.
	Treacle	1 ,,
	Water	5 pints

Heat nearly to boiling and add A. with constant stirring. Stand until cold and decant the clear liquor.

For use, dilute 1 part with 9 parts of water. This is a specific for potato blight.

Winter Wash for Fruit Trees

Caustic Soda	¾ lb.
Soft Soap	3 oz.
Kerosene	16 fl. oz.
Water	3 gal.

Emulsify the Kerosene with the soft soap dissolved in a pint of water. Dilute this gradually with the Caustic Soda previously dissolved in the remainder of the water.

Destroyer for Soil Pests

Crude Naphthalin	25
Sand	75

Fork lightly into the soil, using about 2 oz. per square yard.

NOTE.—Crude naphthalene, which contains adhering cresolic and phenolic bodies, is more active as an insecticide and germicide than the clean white article.

1. Worm Killers for Lawns

Powdered Quassia	10 lb.
,, Cocculus Indicus	2 ,,
,, Quillaia	2 ,,
Ground Peatmoss	28 ,,
Soil to make	1 cwt.

Spread thinly on the lawn and water freely. A fine sprinkler must be used.

2. The most effective worm killer is the ground Mowra seed-cake imported from India. It is used as above.

3. The cheapest worm killer is very dilute solution of Chlorinated Lime, about 7 lb. to 100 gals. of water. It must be washed into the soil with plenty of water.

WEED KILLERS

(*See* Poisons, Pharmacy Act, Schedule 1.)

Arsenic	2 lb.
Caustic Soda	$1\frac{3}{4}$,,
Water	12 gals.

Boil until dissolved. Cool and add—

Crude Carbolic Acid	$\frac{1}{4}$ pint
Common Ink	1 quart

For use dilute 1 gal. with 25 gals. of water. *This is exceedingly poisonous.*

Non-poisonous Weed Killer

Alum	7 lb.
Green Vitriol	7 ,,
Water	6 gals.

For use, dilute 1 gal. with 4 gals. of water.

VERMIN KILLERS & INSECTICIDES

Intending Vendors of Vermin Killers are referred to the Pharmacy Act (Poison Schedule) and to the Arsenic Act. See INDEX.

Beetle or Cockroach Poisons

1. Borax sprinkled near their haunts often drives cockroaches away.

2. Pyrethrum Powder . . 14 oz.
   Barium Carbonate . . 1½ ,,
   Sugar . . . . ½ ,,

3. Borax . . . . 1 lb.
   Crude Carbolic Acid . . 1 oz.

4. Red Lead . . . . 1 oz.
   Sugar . . . . 1 ,,
   Starch . . . . 1 ,,

5. Sugar of Lead . . . 1 oz.
   Red Lead . . . . 1 ,,
   Flour . . . . 2 ,,
   Sugar . . . . 1 ,,

6. Barium Carbonate . . 1 oz.
   Sugar . . . . 1 ,,

Rat and Mouse Poisons

1. Strychnine . . . 1 dr.
   Sugar . . . . 1 oz.
   Oatmeal . . . . ½ ,,
   Ultramarine . . . 10 gr.

   About 20 grains for a 3*d.* packet.

2. Strychnine Hydrochloride . 1 dr.
   Sugar . . . . 1 oz.
   Powdered Biscuit . . ½ ,,
   ,, ,, Aniseed . . ½ dr.
   Ultramarine . . 10 gr.

3. Arsenic . . . . 1 oz.
   Powdered Biscuit . . 1 ,,
   Ultramarine . . . 10 gr.
   Oil of Aniseed . . . 2 drops

4. Arsenic . . . . 1 oz.
   Crushed Linseed . . 1 ,,
   Soot . . . . . 1 dr.

NOTE.—The packet should carry instructions directing powdered biscuit to be put down for several nights before laying down the poison. Also directions to remove early in the morning before children, dogs, or cats are about.

5. Phosphorus . . . 1½ dr.
Warm Water . . . 2 fl. oz.

Warm gently until melted. Pour on to—

Beef Dripping . . . 3 oz.

Mix well and add—

Powdered Biscuit . . 9 oz.
Extract of Meat . . 1 dr.
Water . . . . sufficient to make a paste

Instead of melting the Phosphorus in hot water, it may be dissolved in *redistilled* Carbon Bisulphide and added to the melted beef dripping. The solvent will evaporate during the kneading operation.

Fly Papers

1. Quassia . . . 7 lb.

Boil with successive portions of water until exhausted. Concentrate to 1 gal. In this dissolve—

Brown Sugar . . . ¾ lb.
Glucose . . . . 1 dr.

Dip unsized brown or other coloured paper in this; dry, and cut into sheets.

2. *Arsenical Fly Papers*

Sodium Arsenate . . 8 oz.
Brown Sugar . . . 1½ lb.
Water . . . . 1 gal.

Dissolve. Dip unsized purple paper in the solution; dry, and cut into sheets. Each sheet should have the word POISON in very bold type. It must have the name and address of the seller, who must be a registered chemist and druggist.

3. *Sticky Fly Papers*

Boil Linseed Oil until it becomes stringy. Dissolve 4 parts of this, 1 part of Castor Oil, and 1 part of Thus in Bisulphide of Carbon. Paint strips or sheets of parchment paper with the mixture.

Moth Bricks

1. Cedar Dust,
Vetivert,
Camphor,
Insect Powder,
Orris Powder,
Powdered Soap . of each equal parts

Make into a mass with Acetone. Roll into a flat cake between straight-edges to keep the thickness even. Cut into cakes with a tin shape.

2. Black Pepper,
Cedar Dust,
Insect Powder . of each 1 lb.
Benzoin,
Camphor,
Naphthalene,
Powdered Soap . of each 2 oz.
Acetone . . . . sufficient to make a mass.

Prepare as No. 1.

MICROSCOPICAL REAGENTS, Etc.

Canada Balsam Solution

Canada Balsam (dried on water bath for eight hours) 1 part
Xylol . . . . 1 fl. part

Chloral Hydrate Solution

Saturated Solution of Chloral Hydrate in water.

Carbol-Fuchsin

Fuchsin . . . . ½ part
Rectified Spirit . . . 10 parts
Carbolic Acid . . . 5 ,,
Distilled Water . to make 110 ,,

Löffler's Methylene Blue

Methylene Blue . . . 1½ part
Rectified Spirit . . . 30 parts
Caustic Potash . . . a trace
Distilled Water . to make 130 parts

Ehrlich's Triple Stain

Methyl Green . . . 1 part
Acid Fuchsin . . . 1 ,,
Orange G. . . . 4 parts
Distilled Water . to make 640 ,,

Farrant's Mounting Medium

Arsenic . . . . ¼ oz.
Distilled Water . . . 25 fl. oz.
Glycerin . . . . 25 ,,
Picked Gum Arabic to saturate.

Gelatin-Glycerin Jelly

Gelatin	1 oz.
Distilled Water	5 fl. oz.
Glycerin	5 ,,
Carbolic Acid	30 gr.

Ebner's Fluid

Sodium Chloride	10 parts
Hydrochloric Acid	1 part
Distilled Water	89 parts

Kleinenberg's Fluid

Saturated Solution of Picric Acid	50 c.c.
Sulphuric Acid, 1·843	1 ,,
Distilled Water to	200 ,,

Stearin and Naphthalene Embedding Medium

Stearic Acid	75 parts
Naphthalene	15 ,,

Melt together.

Müller's Hardening Fluid

Potassium Bichromate	2 grammes
Sodium Sulphate	1 ,,
Distilled Water to	100 c.c.

Flemming's Fixing Fluid

Osmic Acid Solution, 1 per cent.	80 c.c.
Chromic Acid	1·5 gramme
Glacial Acetic Acid	10 c.c.
Distilled Water to	200 ,,

Cuoxam

Place clean Copper turnings in a wide-mouth bottle with Solution of Ammonia. Aspirate air through until the liquid becomes deep blue. This reagent dissolves cellulose instantly.

Millon's Reagent for Proteids

Mercury	13 grammes
Nitric Acid, 1·5	10 c.c.

Dissolve, keep mixture cool. Add—

Distilled Water	an equal volume

Eosin-Gram-Weigert Method of Staining

1. Stain in Eosin five minutes and wash with water. Rinse with Alcohol.

2. Stain in Aniline Gentian Violet for ten minutes.

3. Transfer to Gram's Solution for three minutes.

4. Decolorise in Aniline, clear with Xylol, and mount in Xylol Balsam.

Gabbett's Stain for Tubercle

A. *Fuchsine Solution*

Fuchsine	1 part
Absolute Alcohol	10 parts
5 per cent. Phenol Solution	100 „

B. *Methylene Blue Solution*

Methylene Blue	2 parts
Sulphuric Acid	25 „
Distilled Water	75 „

Stain for three minutes with A (warm); then for two minutes with B. Wash, dry, clear with Xylol, and mount in Xylol Balsam.

Gram's Method for Cover Slip Preparations

Stain with Aniline Gentian Violet five minutes, and transfer to Gram's Iodine Solution half to one minute. Rinse in Alcohol until no more stain comes away. Wash in water, dry, and mount in Xylol Balsam.

If desired, counterstain with Eosin.

Nutrient Broth

Liebig's Extract	5 grammes
Beef Peptone	10 „
Salt	5 „
Distilled Water	1,000 c.c.

Boil and make faintly alkaline with Bicarbonate of Soda. Filter and sterilise.

Nutrient Gelatin.

Nutrient Broth as above	1,000 c.c.
Pale Sheet Gelatin	125 grammes

Dissolve, clarify with white of egg, make faintly alkaline, filter, and sterilise.

Nutrient Agar-Agar

Agar-Agar (white)	20 grammes
Nutrient Broth	1,000 c.c.

Boil until dissolved. Clarify with white of egg, filter, and sterilise.

Pasteur's Nutrient Solution

Sugar Candy	10 grammes
Ammonium Tartrate	1 gramme
Potassium Phosphate	0·5 ,,
Distilled Water	100 c.c.

Preserving Fluid for Anatomical Specimens

Alum	100 parts
Sodium Chloride	25 ,,
Potassium Nitrate	12 ,,
Potassium Hydroxide	60 ,,
Arsenious Oxide	10 ,,
Boiling Water	3000 ,,

Dissolve, cool, and filter. To every 1000 fluid parts add—

Glycerin	400 fl. parts
Methylic Alcohol	100 ,,

Bleaching Animal Tissues

A. Solution of Potassium Permanganate.

B. Solution of Sodium Bisulphite.

Dip first in Solution A, afterwards in Solution B. Wash well with water. Repeat if necessary.

Wickersheimer's Preserving Fluid

Arsenious Acid	16 grammes	12 grammes
Sodium Chloride	80 ,,	60 ,,
Potassium Sulphate	200 ,,	150 ,,
,, ,, Nitrate	25 ,,	18 ,,
,, ,, Carbonate	20 ,,	15 ,,
Distilled Water	10 litres	10 litres
Glycerin	4 ,,	4 ,,
Wood Naphtha	0·75 litre	0·75 litre

Preserving Liquid

(*a*) *Larvæ, hydræ, Nemarodæ*

35 per cent. Glycerin in Water	10 parts
Crude Pyroligneous Acid	100 ,,
Salicylic Acid	1 part

(*b*) **Infusoria**

Solution (*a*)	1 part
15 per cent. Glycerin in Water	10 parts

(*c*) **Algæ**

Solution (*a*)	1 part
5 per cent. Glycerin in Water	20 parts

Chloral Carmine

Carmine	2 parts
Hydrochloric Acid	2 ,,
Absolute Alcohol	20 ,,

Heat under reflux condenser on water bath for half an hour, and add—

Chloral Hydrate	25 parts

Cool and filter.

MISCELLANEOUS FORMULAS

Anti-dimming Preparations for Glass

1.

Cocoanut Oil Soap	1¼ lb.
Tripoli	2 oz.
Alum	1 ,,
Cream of Tartar	1 ,,
White Lead, powder	1 ,,
Water	a sufficiency

Dissolve the soap in water, and evaporate until a little sets to a clear jelly when cooled. Then add the powders, finely ground and mixed. Pour into shallow moulds to cool.

To use—moisten the glass with warm water, smear evenly with the soap, and polish with a dry soft cloth.

2.

Soft Soap	1 oz.
Methylated Spirit	1 pint

3.

Glycerin	1 fl. oz.
Water	15 ,,

4.

Borax	5 gr.
Tartaric Acid	5 ,,
Boric Acid	½ oz.
Water	1 pint

Arsenical Paste for Curing Skins

Potassium Carbonate	12 oz.
Arsenious Oxide	4 ,,
Soft Soap	4 ,,
Slaked Lime	4 ,,
Powdered Camphor	¾ ,,
,, ,, Black Pepper	¾ ,,

Water, a sufficiency, to make a soft paste.

Battery Solutions

1. *For Leclanché Cell*

Nearly Saturated Solution of Sal Ammoniac.

2. *For Carbon and Zinc Battery*

Sodium Bichromate	.	.	4 oz.
Sulphuric Acid	.	.	4 fl. oz.
Distilled Water	.	to	2 pints

Bleaching Cane for Baskets

Make a suitable sized bath of boiling water and dissolve in it 1 lb. of washing soda to each gallon. Steep the cane in this for one to two hours, then wash or soak the cane in clean cold water. Make a bleaching bath by mixing ½ lb. of chlorinated lime to each gallon of water, and immerse the cane in this for about twelve hours. Next put the cane into an acid bath containing half a pint of sulphuric acid to each 3 quarts of water. Finally, wash well in clean water to remove acid completely. It is best to pass some spare pieces of cane through the process first, to judge the result.

Boiler Solution

1. Washing Soda	.	.	4 lb.
Yellow Dextrin	.	.	8 ,,
Water	.	.	8 gals.

Mix 1 quart with every 1000 gals. evaporated.

2. Catechu	.	.	10 parts
Caustic Potash	.	.	5 ,,
,, Soda	.	.	5 ,,
Rosin	.	.	1 ,,
Lime	.	.	20 ,,
Water	.	.	30 ,,

Boil the Lime, Rosin, Soda and Potash with half the water for half an hour. Stand. Dissolve the Catechu in the remainder of the water. Mix the two solutions.

Use 1 pint for every horse-power, renewing every six weeks.

3. Quebracho Extract	.	.	1 lb.
Water	.	.	2 gal.

Mix 1 pint with every 1000 gals. evaporated.

Chemical Gardens.

Three or four half-gallon fish globes are filled to the depth of 2 or 3 in. with fine sand ; in this layer of sand crystals of Copper Sulphate, Aluminium Sulphate, Iron Sulphate, Chrome Alum, Lead Acetate, Calcium Chloride, Magnesium Sulphate, and Manganese Sulphate are embedded. Then over the whole a solution of Sodium Silicate (commercial water-glass) 1 part and water 3 parts is poured, being careful not to disturb the chemicals in

pouring in the solution. The silicates of the bases produce a dense growth, in various colours and fantastic shapes, that attracts much attention.

Metallic Trees

Lead Tree

Dissolve 1 oz. Lead Acetate in 1 quart distilled water, adding a few drops Acetic Acid. Allow to deposit, and suspend a piece of clean Zinc in the solution. Set aside.

Silver Tree

Dissolve 60 gr. Silver Nitrate in 3 oz. of distilled water. Place in a flask and add about a drachm of Mercury. Set aside.

Tin Tree

Dissolve ¼ oz. Tin Chloride in a pint of distilled water with 10 drops Nitric Acid. Suspend in it a rod of Zinc. Set aside.

Solvents for Celluloid

An excellent solvent for celluloid is Acetone, which has the advantages over Anyl Acetate in that it evaporates more quickly and has no unpleasant smell. It cannot, however, be used alone when a clear varnish is required, as solutions of Celluloid in Acetone produce a matt surface. Other solvents are Tetraline, Hexaline, Methylhexaline, Hexaline Acetate, and Isobutyl Acetate. Celluloid is dissolved directly by Hexaline Acetate and Isobutyl Acetate, slowly in the former and more quickly in the latter, but in each case with a great amount of swelling. Of these solvents, Hexaline Acetate (Cyclohexanol Acetate) is an almost colourless, pleasant-smelling liquid of sp. gr. 0·970, refractive index 1·438, and boiling point between 170° and 175° C. A 2 per cent. solution of Celluloid in this solvent is somewhat viscous, flows very evenly when poured on to a glass plate, and gives a tough, clear film of varnish. But evaporation is very slow, and solution, too, proceeds somewhat slowly. To remedy this Celluloid is dissolved in Acetone, and the strong solution thus obtained is let down to a strength of 2 per cent. by the addition of Hexaline Acetate. It is found that an addition of 10 per cent. of Hexaline Acetate to an Acetone solution containing a corresponding amount of Celluloid was sufficient to give a sufficiently rapid-drying, glass-clear film. Spoiled celluloid films or film negatives may be used for producing celluloid varnishes, but they should first be freed from gelatin with hot water, and dried.

Charcoal Pencils for Cutting Glass

Wood Charcoal	90 parts
Saltpetre	2 ,,
Benzoin	1 part
Tragacanth	2 parts

Make into a paste; roll quickly into pencils; dry thoroughly. Start the crack with a file, and lead in the desired direction with the incandescent tip of a pencil.

Colouring Electric Light Bulbs

The varnishes for colouring electric light bulbs are usually made by dissolving sheet Celluloid (2 to 3 per cent.) in Amyl Acetate, and then adding the desired Aniline colouring. If it is desired to produce an opaque effect, a small quantity of light Magnesia may be incorporated with the varnish.

COLOURS FOR SHOW BOTTLES

Amber

1. Dragon's Blood . . . 1 part
   Sulphuric Acid . . . 4 parts
   Dilute to required shade.

2. Deep Chrome Yellow . . 3 oz.
   Potassium Carbonate . . 9 ,,
   Distilled Water . . . 2 gals.

   Boil for half an hour; cool; add—

   Hydrochloric Acid . . 6 fl. oz.
   Distilled Water . . . a sufficiency

Amethyst

Salicylic Acid . . . 5 gr.
Solution of Ammonia . . a slight excess
Distilled Water . . . 2 gals. or a sufficiency

Dissolve and add—

Solution of Perchloride of Iron . . . . a few drops
Hydrochloric Acid . . 10 min.

Blue

1. Cupric Sulphate . . . ½ lb.
   Distilled Water . . . 1 gal.
   Sulphuric Acid . . . 1 fl. oz.

2. Oxalic Acid . . . 2 dr.
   Potassium Ferrocyanide . 10 gr.
   Stronger Solution of Ferric Chloride . . . 10 drops
   Distilled Water . . . 1 gal.

3. Cupric Sulphate . . . 8 oz.
   Distilled Water . . . 1 gal.

Dissolve, and add Solution of Ammonia until the desired depth of colour is produced.

4. Copper Nitrate . . . 3 oz.
   Distilled Water . . . 1 gal.

Dissolve, and add Solution of Ammonia until the desired depth of colour is produced.

Light Blue

Crystallised Copper Acetate . ½ oz.
Distilled Water . . . 1 gal.

Dissolve, and add Solution of Ammonia until the desired depth of colour is produced.

Crimson

1. Iodine . . . . ¼ oz.
   Potassium Iodide . . ¼ ,,
   Distilled Water . . . 1 gal.

   Dissolve and add—

   Hydrochloric Acid . . 1 fl. oz.

2. Potassium Permanganate . ¼ oz.
   Caustic Potash . . . ¼ ,,
   Distilled Water . . . 2 gals. or a sufficiency

Boil in an enamelled iron vessel for five minutes. Cool and decant. Do not filter.

The solution cannot be diluted with distilled water, as a precipitate invariably forms.

Fluorescent

Fluorescein . . . 10 gr.
Distilled Water . . . 2 gals.
Oil of Clove, a few drops added to the carboy not shaken, to prevent mould.

Green

1. Any of the preceding blue colours
   Concentrated Infusion of Saffron . . . a sufficiency

2. Sulphate of Copper . . 4 oz.
   Distilled Water . . . ½ gal.
   Potassium Bichromate . . ½ dr.
   Distilled Water . . . ½ gal.

Dissolve the Sulphate and Bichromate separately, and mix the two solutions.

3. Copper Sulphate . . . 1 dr.
   Potassium Bichromate . . ½ ,,
   Strong Solution of Ammonia 2 fl. oz.
   Distilled Water . . . 1 gal.

4. Copper Sulphate . . 1 lb.
   Common Salt . . . 3 ,,
   Hydrochloric Acid . . 1 pint
   Distilled Water . . . 2 gals.

Emerald Green

1. Copper Nitrate . . 3 oz.
   Hydrochloric Acid . . 4 fl. oz.
   Nitric Acid . . . 4 ,,
   Distilled Water . . . a sufficiency

2. Nickel Sulphate . . . 3 oz.
   Distilled Water . . . 2 gals.

   Mix and add slowly—

   Sulphuric Acid . . . 5 fl. oz.

Olive Green

A
- Ferrous Sulphate . . 3 oz.
- Sulphuric Acid . . . 3 fl. oz.
- Distilled Water . . 1 gal.

B
- Copper Nitrate . . 3 oz.
- Hydrochloric Acid . . 4 ,,
- Nitric Acid . . . 4 ,,
- Distilled Water . . 1 gal.

Add A to B until the desired shade is obtained.

Magenta

Fuchsine dissolved in distilled water.

Pink or Rose

1. Madder . . . . 1 oz.
   Boiling Distilled Water . 1 gal.

   Infuse until cold. Strain and add—

   Solution of Ammonia . . . 2 fl. oz. or a sufficiency

2. Cobalt Chloride . . . 2 oz.
   Distilled Water . . . 4 pints

Dissolve, and add strong solution of Ammonium Carbonate until the precipitate which at first forms is all re-dissolved. Dilute.

Purple

Cupric Sulphate	½ oz.
Distilled Water	2 fl. oz.

Dissolve and add to a solution of—

Colourless Gelatin	1 dr.
Water	2 fl. oz.

Mix and add—

Solution of Potash (B.P.)	2 pints

Shake occasionally during two or three days, filter through Kieselguhr, and dilute to the desired tint.

Red

1. Concentrated Acid Infusion of Red Rose Petals — a sufficiency
   Salicylic Acid — ½ per cent.
2. Cochineal, bruised — ½ oz.
   Boiling Water, distilled — 1 gal.

Infuse for twenty-four hours, stirring occasionally. Bring up to boil, cool, strain ; add—

Sulphuric Acid	½ fl. oz.

3. Fuchsine — 20 gr.
   Acetic Acid — 2 fl. oz.
   Distilled Water — 1 gal.

Yellow

Chromate or Bichromate of Potassium dissolved in distilled water to the required shade. The colour may be varied by adding Sulphuric Acid.

Canary Yellow

Picric Acid	1 oz.
Distilled Water	1 gal.

COLOURED FIRES

All ingredients must be dried and powdered separately unless otherwise directed. Mix in a wooden vessel with a wooden spatula. In the United Kingdom it is illegal to make coloured fires except on licensed premises (Explosives Act, 1875).

Blue Fire

1. Potassium Nitrate — 16 parts
   Crude Black Antimony — 8 „
   Zinc — 7 „

2. Ammoniacal Cupric Sulphate . . 2 parts
   Potassium Chlorate . . . 4 ,,
   Washed Flowers of Sulphur . 1 part

3. Potassium Chlorate . . 3 parts
   Mountain Blue . . . 1 part
   Washed Flowers of Sulphur 1 ,,

Red Fire

1. Potassium Chlorate . . 5 parts
   Strontium Nitrate . . 16 ,,
   Arsenious Sulphide . . 1 part
   Washed Flowers of Sulphur . 2 parts
   Soot . . . . . 1 part

2. Strontium Nitrate . . 20 parts
   Potassium Chlorate . . 2 ,,
   Washed Flowers of Sulphur . 5 ,,
   Crude Antimony Sulphide . ½ part
   Charcoal . . . . 2 parts

3. Strontium Nitrate . . 48 parts
   Washed Flowers of Sulphur . 9 ,,
   Charcoal . . . . 2 ,,
   Potassium Chlorate . . 8 ,,

4. Strontium Nitrate . . 5 parts
   Washed Flowers of Sulphur . 15 ,,
   Charcoal . . . . ½ part
   Potassium Chlorate . . 6 parts

5. Shellac . . . . 16 parts
   Strontium Nitrate . . 82 ,,
   Powdered Magnesium . 2 ,,

Violet Fire

Potassium Chlorate . . 49 parts
Washed Flowers of Sulphur . 25 ,,
Precipitated Chalk . . 20 ,,
Black Oxide of Copper . 6 ,,

White Fire

1. Potassium Nitrate . . 24 parts
   Washed Flowers of Sulphur . 7 ,,
   Arsenious Sulphide . . 2 ,,

2. Potassium Nitrate . . 4 parts
   Washed Flowers of Sulphur . 2 ,,
   Antimonious Sulphide . 1 part

3. Potassium Nitrate . . 16 parts
   Washed Flowers of Sulphur . 8 ,,
   Flour . . . . 3 ,,

4.	Potassium Nitrate . .	16 parts
	Antimonious Sulphide .	3 ,,
	Washed Flowers of Sulphur .	5 ,,
5.	Potassium Nitrate . .	32 parts
	Washed Flowers of Sulphur .	8 ,,
	Antimonious Sulphide .	12 ,,
	Red Lead	11 ,,

Brilliant White Fire

Shellac	14 parts
Barium Nitrate . . .	84 ,,
Powdered Magnesium . .	2 ,,

Mix the Shellac and Nitrate. Fuse. Cool. Powder and mix with the Magnesium.

Yellow Fire

1.	Sodium Nitrate . . .	24 parts
	Arsenious Sulphide . .	2 ,,
	Washed Flowers of Sulphur .	7 ,,
	Crude Black Antimony .	2 ,,
2.	Sodium Nitrate . . .	16 parts
	Washed Flowers of Sulphur .	4 ,,
	Flour	16 ,,
	Resin	7 ,,
	Pitch	4 ,,
3.	Sodium Nitrate . . .	6 parts
	Washed Flowers of Sulphur .	1 part
	Soot	1 ,,

Deodorised Benzol

1.	Benzol . . .	1 gal.
	Sulphuric Acid . . .	1 fl. oz.
	Potassium Dichromate .	1 oz.
	Water	1 pint

Make a solution of the last three and shake with the Benzol occasionally during several days. Decant. Wash the Benzol with clean water. Decant again and filter through a little freshly dried Sodium Sulphate.

2. A still further improvement is effected by shaking the product from (1) with Mercury that has been recently strained through clean wash-leather.

Perfumes for Deodorised Benzol

1.	Oil of Lavender . . .	1 fl. dr. to 1 pint
2.	Coumarin	2 gr.
	Vanillin	2 ,,
	Heliotropin . . .	1 ,,
	Absolute Alcohol . .	1 fl. dr.

To each pint.

Deodorised Carbon Disulphide

Shake with Mercuric Chloride solution (2 per cent.) and decant from the aqueous layer. Mix with liquid paraffin and distil over a water bath.

NOTE.—Carbon Disulphide is extremely inflammable.

Duplicating Pad

Kaolin, 45 ; starch, 15 ; made into a putty with a mixture of glycerin, 30, and water, 10, with a little Mucilage of Acacia.

Duplicating Paper

One method for this is to melt 10 parts of lard, 1 part of wax, and mix in a sufficient quantity of fine lampblack. Treat unglazed paper with this ; remove excess and press. Another formula specifies lard, 12 ; beeswax, 2 ; melted together, and poured into a warm mortar on to finest lampblack, 2. When thoroughly mixed it is brushed, while still warm, over the surface of the soft paper, and the excess removed with a piece of flannel.

Etching Names on Bottles

Coat the surface of the glass with wax or hard paraffin, softened by the addition of soft paraffin, trace out the letters with a suitable stylus, apply strong Hydrofluoric Acid by means of a feather. The acid is allowed to remain until it has eaten out a sufficiently deep mark. Etching done in this way produces a clear surface. If a ground-glass effect be desired, the acid must be applied in a gaseous state. To do this, mix two parts of powdered Fluorspar with three of Sulphuric Acid in a suitably shaped lead trough ; stir quickly with a wooden rod, and warm until the gas is evolved ; then lay the bottle over the trough in such a way that the gas may play freely on the designed surface. When sufficiently etched, wash the bottle and remove the wax. Although either of these processes will produce satisfactory results, neither will give markings like those on the ordinary glass measures ; these are made by emery or other hard-substance wheels.

Extinguishing Burning Petroleum or Benzol

Throw sand or any similar absorbent material, then quench the flames with Chloroform or Carbon Tetrachloride.

Extinguishing Fires in Chimneys

Place a few ounces of Sulphur in a shovel over the fire, and allow the fumes to escape up the chimney.

Fire-extinguishing Liquids, &c.

The ordinary cylinders containing compressed Carbon Dioxide may be used by directing the stream of gas from the nozzle of the cylinder, to which a suitable flexible tube may be attached if desired, on to the seat of the fire. Of formulas for fire-extinguishing liquids there is no end. The following are typical examples :

1. Common Salt . . . 20 lb.
   Ammonium Chloride . . 10 ,,
   Water . . . . 6 to 7 gals.

2. Sodium Carbonate . . 8 lb.
   Alum . . . . 4 ,,
   Borax . . . . 3 ,,
   Potassium Carbonate . . 1 ,,
   Sodium Silicate Solution . 24 ,,

Mix. 1½ lb. of this mixture is added to each gallon of water when required for use.

3. Calcium Chloride . . 15 lbs.
   Sodium Chloride . . 5 ,,

Dissolve in sufficient water to make 10 gals.

According to ' Thorpe,' ' one of the most effective of the many solutions that can be used for this purpose is a solution of a mixture of Sodium Sulphite and Ammonium Chloride in molecular proportions. When this is thrown upon a hot fire, Sulphur Dioxide and Ammonia are set free, and smother the combustion, whilst the combustible matter is coated with a glaze of common salt.'

Fireproofing Solution for Fabrics

1. Borax . . . . 4 parts
   Magnesium Sulphate . . 3 ,,
   Water . . . . 25 ,,

Dip the fabric in the solution, wring and dry.

2. Saturated solution of Sodium Tungstate may also be used.

3. Ammonium Sulphate . . 8 parts
   ,, ,, Carbonate . 2 ,,
   Borax . . . . 4 ,,
   Starch . . . . 1 part

Mix with boiling water so as to gelatinise the starch.

4. Borax . . . . 6 parts
   Boric Acid . . . 5 ,,
   Water . . . .100 ,,

The fabric is soaked in this solution, and then simply hung up to drain and dry. For the painting of back-

grounds, the Borax and Boric Acid should be dissolved in the size used as the medium for pigment or other colours. The mixture does not rot or stiffen the fabrics.

Fixative for Crayon Drawings

White Shellac, *powdered and exposed in a warm place until dry* . . . . 2 oz.
Acetone . . . . 5 fl. oz.
Industrial Spirit (*not Mineralised*) to . . . 4 pints
Camphor . . . . 20 gr.

FREEZING MIXTURES

1. Sodium Sulphate (powdered crystals) . . . 16 parts
   Hydrochloric Acid . . 12 ,,
   about
   Reduction of temperature to about — 33° C.

2. Snow or Crushed Ice . . 2 parts
   Hydrochloric Acid . . 1 part
   Reduction, when the acid has been previously cooled in snow, to — 32° C.

3. Snow or Crushed Ice . . 2 parts
   Common Salt . . . 1 part
   Temperature falls to — 5° F.

4. Snow or Crushed Ice . . 5 parts
   Common Salt . . . 2 ,,
   Ammonium Chloride . . 1 part
   Temperature falls to — 12° F.

5. Snow or Crushed Ice . . 12 parts
   Common Salt . . . 5 ,,
   Ammonium Nitrate . . 5 ,,
   Temperature falls to — 25° F.

6. This is one of the most convenient and gives a very low temperature—

Sodium Carbonate Crystals . 1 part
Ammonium Chloride . . 1 ,,
Water or Crushed Ice . . 1 ,,

ANTI-FREEZING SOLUTIONS

1. Calcium Chloride . . 3 lb.
   Water . . . . 1 gal.

2. Glycerin . . . . 2 lb.
   Water . . . . 1 gal.

3.	Methylated Spirit	1 pint
	Water	1 gal.
4.	Methylated Spirit	4 fl. oz.
	Glycerin	4 ,,
	Water	1 pint

As the Alcohol evaporates it is necessary to add a little more from time to time to maintain the solution at its original strength.

Frosting Glass

Finely sift a suitable abrasive material (like Emery flour or Carborundum powder). Take two sheets of glass, place the powder between with a little water. Hold the top piece of glass gently and grind with a circular motion. Wash from time to time and watch progress. Where the surface still remains bright (as it will between the pressure points), add more abrasive and re-grind. In the case of a window-pane, use a damp rag sprinkled with the powder. The grain of the 'frosting' will depend upon the fineness of the abrasive. This method will produce beautifully fine-grained focussing screens from old negatives.

Frosted Glass (Imitation)

Paint the glass with saturated solution of Epsom Salt to which a very little Mucilage of Acacia has been added.

Grease-proof Paper

Draw sheets of parchment paper through *thin* Collodion, and allow to evaporate.

Such paper is absolutely impervious to grease.

Gut Reviver

Shellac	3 oz.
Sandarac	1½ ,,
Castor Oil	½ fl. oz.
Methylated Spirit	1 pint

Dissolve and decant the clear liquor. This should be applied with a soft brush, when the racket is quite dry. Stand until thoroughly dry. An occasional rub with a rag containing a little liquid paraffin preserves the life of the gut.

Hardening Plaster of Paris

To calcined Plaster of Paris add 2 to 4 per cent. of its weight of powdered Marshmallow Root, which will delay setting and augment its hardness when set; with double the quantity of powdered Marshmallow Root the plaster will become very firm, may be worked two or three

minutes after mixing, and may be carved and polished when hard. It is essential that the two powders be thoroughly mixed by sifting, after first making sure that they are perfectly dry and the Plaster of Paris quite fresh. The mixture is made into a paste with water in the ordinary way. Dextrin, Gum Arabic, and glue have a similar effect.

The Hectograph or Copying Pad

Gelatin	4 oz.
Water	8 fl. oz.

Stand for twenty-four hours, turning over occasionally. Add to—

Glycerin at 200° F.	14 fl. oz.

Stir gently so as to avoid formation of bubbles, and pour into a tin tray about $\frac{3}{8}$ to $\frac{1}{2}$ inch deep, placed on a perfectly level table. Allow to set.

The writing must be done with special Hectograph Ink upon well-glazed paper, and then allowed to become perfectly dry.

Place the sheet upon the pad, face downwards, and with a photographic roller press perfectly flat. Allow to remain in contact for five minutes. Remove. Copies are taken by pressing on the pad, paper nearly free from size. A few seconds suffices for the first impression, but afterwards, as the ink becomes exhausted, a longer time must be given and the paper must be slightly damp. With care there is no difficulty in taking from twenty-five to fifty impressions.

Afterwards clean off with a sponge dipped in a mixture of—

Hydrochloric Acid	1 part
Methylated Spirit	9 parts

and set aside for a few hours before using again. After much use the pad may require re-melting.

Modelling Clay

A mixture of equal parts of beeswax, lead plaster, olive oil, and yellow resin, with sufficient whiting to form a suitable mass, is used. Another recipe is—

Beeswax	200 parts
Venice Turpentine	26 ,,
Lard	13 ,,
Bole	145 ,,

Mix and knead in water.

Also, for summer use—

White Wax . . .	20 parts
Common Turpentine . .	4 „
Sesame Oil. . . .	1 part
Vermilion	2 parts

For winter use—

White Wax . . .	20 parts
Common Turpentine . .	6 „
Sesame Oil . . .	2 „
Vermilion	2 „

The ingredients, melted and thoroughly mixed, are poured into tepid water and kneaded to a plastic mass. The following is a recently patented modelling mass : Paraffin wax, having a setting point of from 104–112° C., is more or less melted and mixed or kneaded with French chalk. About equal weights of the two substances should be used. Colouring matter and any desired perfume may be added, and a glaze or marble-like effect may be produced by working with suitable tools. It is claimed as being quite plastic and capable of taking impressions at the temperature of the human body, but will set when cooled somewhat below that temperature.

Rust Proof Coating for Iron

(' *Coslettising.*')

The Coslettising process for producing a rust-proof finish for iron consists in boiling the article in a solution of 1 gal. of water, 4 fl. oz. of Phosphoric Acid sp. gr. 1·5, and 1 oz. of iron filings, and well washing. This produces a black coating which protects iron or steel against atmospheric and other corrosive influences.

To Prevent Rusting

Celluloid	1 oz.
Acetone	10 fl. oz.
Amyl Acetate . .	10 fl. oz.

Clean and dry the article thoroughly, then apply the lacquer thinly with a suitable brush.

Dead Dipping

For the Production of a Pale Yellow Dead Surface on Brass

Place in dilute Nitric Acid, wash with water and immerse in stronger Nitric Acid. When the surface is covered with bubbles plunge in a solution of Cream of Tartar and dry in hot sawdust.

Bronzing of Metals

Thoroughly cleanse the bright metal from grease. Paint with dilute solution of Ammonium Hydrosulphide and allow to dry. Brush off any separated Sulphur. Next paint with dilute ammoniacal solution of Arsenic Sulphide. This produces a colour resembling *mosaic gold*, and becomes deeper by repeating the application. Substituting Antimony Sulphide for the Arsenic, a rose-coloured tint is obtained. A second application will change this to deep red.

The bronzing layer may be removed by Ammonia.

Bronzing Liquid

Fuchsin	10 parts
Aniline Purple	5 ,,
Alcohol 95 per cent.	100 ,,

Dissolve and add—

Benzoic Acid	5 parts

Boil for a few minutes until colour changes to a bronze-brown. Apply with a brush.

Blackening Steel

a.	Sodium Hyposulphite	4½ oz.
	Water	40 fl. oz.
b.	Lead Acetate	1¼ oz.
	Water	40 fl. oz.

Mix the two solutions in an enamelled dish and boil.

Remove every trace of grease from the articles with Caustic Soda, rinse, warm them and apply the solution with a sponge. When fully developed, rinse, dry and polish with boiled Linseed Oil. This solution is poisonous.

Blueing Steel

Ferric Chloride	2 oz.
Antimony Chloride	2 ,,
Gallic Acid	1 ,,
Water	5 fl. oz.

Apply to the grease-free articles with a sponge and allow to dry. Repeat if necessary. Afterwards polish with boiled Linseed Oil. This solution is poisonous.

Browning Steel

Methylated Spirit	1½ oz.
Tincture of Ferric Chloride	1½ ,,
Mercuric Chloride	1½ ,,
Sweet Spirit of Nitre	1½ ,,
Cupric Sulphate	1 ,,
Nitric Acid	¾ ,,

Mix and dissolve in a quart of hot water. After removal of grease apply the solution with a sponge and expose to the air for twenty-four hours. Brush with a steel brush. Repeat the process. Lastly, rinse, dry and polish with boiled Linseed Oil. This solution is poisonous.

Non-Inflammable Benzine

Petrol	5 fl. oz.
Carbon Tetrachloride	15 „
Oil of Lavender	30 min.

For directions, *see* note on removing Grease Stains.

Oil for Cleaning Rifle Barrels

Kerosene, neutral	2 fl. parts
Sperm Oil	1 part
Oil of Turpentine	1 „
Acetone	1 „

Painting Sheet Zinc

The surface of zinc, either new or old, does not take kindly to paints or varnishes. The zinc should first be treated, as follows :

Copper Chloride	1 oz.
Copper Nitrate	1 „
Sal Ammoniac	1 „
Water	3 pints

Dissolve, and add commercial Hydrochloric Acid, 1 fl. oz. The zinc is brushed over thoroughly with this solution, which turns the zinc a dull black colour, and takes twelve or more hours to dry. When quite dry, the paint or varnish may be applied in the usual way.

Pharaoh's Serpents

Mercury Sulphocyanide	1 oz.
Charcoal Powder	30 gr.
Tragacanth Powder	10 „

Mix well, mass with a little water, divide into small cones and dry.

NOTE.—This mixture and the fumes evolved on igniting are poisonous.

Nickel Plating Steel or Iron without Aid of Battery

Add to 10 per cent. solution of *pure* Zinc Chloride enough Nickel Sulphate solution to impart a distinct green colour, and boil in porcelain vessel. Ignore any deposit.

Suspend the articles to be plated (absolutely free from grease or soap) in the boiling solution for thirty to sixty minutes. Remove, wash in thin chalky water, rinse, and dry. Polish with chalk.

Gold Plating without Aid of Battery

Pure Gold	10 grammes
Hydrochloric Acid	40 ,,
Nitric Acid	15 ,,

Dissolve by gentle heat. Evaporate practically all the acids, add a little water, and precipitate with Ammonia. Wash precipitate with water.

Dissolve—

Potassium Cyanide (99 per cent.)	100 grammes

in the smallest possible quantity of water, and in this dissolve the precipitated Gold. Finally add distilled water to make 1 litre. This solution is poisonous.

Directions.—Immerse the absolutely *grease-free* articles in the solution. Wash, dry, and polish with chalk.

Silver Plating without Aid of Battery

1. Silvering fluids do not give as good results as obtained by electrolytic deposition, but if the latter method is not available, the following liquid gives a fair deposit.

NOTE.—The articles must be absolutely free from grease.

Silver Nitrate Crystals	2 oz.
Distilled Water	4 pints

Dissolve, and add 20 per cent. solution of Potassium Iodide as long as a precipitate forms. Collect and wash free from nitrates. Dissolve the precipitate in hot strong solution of 99 per cent. Potassium Cyanide. Do not add a drop more than is absolutely necessary. Dilute to 1 gal.

Warm the solution to about 180° F., and immerse the grease-free articles for about two minutes. Remove, rinse with distilled water, dry, and polish. This solution is poisonous.

2. Pure Silver . . . 20 grammes
Nitric Acid . . . 60 ,,

Dissolve, add a little water, and precipitate with—

Caustic Potash	20 grammes
Distilled Water	50 ,,

Collect precipitate; wash. Dissolve in—

Potassium Cyanide (99 per cent.)	100 grammes

dissolved in a very little water. Finally dilute to 2 litres.

Directions.—Immerse the *grease-free* articles in the solution. Wash, dry, and polish with chalk. This solution is poisonous.

Preservation of Books against Attacks of Insects, &c.

As a rule insects first attack the glue used in the binding. The hinged parts should be brushed with the following solution, which is poisonous—

Corrosive Sublimate . .	5 dr.
Creosote . . .	1 fl. dr.
Strong Alcohol . .	2 pints

The covers should be painted with quick hard drying spirit varnish, containing 1 part of Quinine Sulphate in 500.

Preserving Eggs

1. Water Glass . . .	1 lb.
Water, boiling . . .	1½ gals.

Dissolve. Cool and pack the eggs in the solution.

2. Lime, slaked . . .	14 lb.
Salt	3 ,,
Cream of Tartar . .	½ ,,
Water	5 gal.

Stand with frequent stirring for two days. Decant the clear liquor, in which pack the eggs.

3. Smear the eggs with vaseline and pack in lime water.

Preserving Leaves and Flowers

Leaves

Half fill a shallow box of any convenient size with finely sifted sand. Place the leaf on the surface, and fill up evenly with more sand. Press down moderately tightly. Bake in an oven (temperature not over 212° F.) for several hours.

Pour off the sand, and immerse the dried leaf in a warm bath of the following—

Hard Paraffin . . .	1 oz.
Petroleum Ether . .	1 pint

Allow to soak for a few minutes, take out, and dry. Mount in the usual way.

Flowers

Proceed in the same way as for leaves, using a box of suitable shape. The sand must be sifted in very carefully so as to preserve the shape. Do not press down.

Razor Paste

Mix finely powdered emery with water; allow the coarser particles to deposit. Pour off the upper layer,

containing the fine powder in suspension, and set on one side. Decant the water and dry the deposit. Make into a stiff paste with equal parts lard and suet. Add 1 drop of Oil of Clove to each ounce.

Safety Razor Blades

To Keep in Condition

Castor Oil	½ fl. oz.
Soft Soap	2 ,,
Methylated Spirit . .	2 pints

Safety razors stored in this solution when not in use keep a fine edge much longer than usual.

To Remove a Ring from a Swollen Finger

If a Gold Ring, pull skin apart so that the ring can be seen. Drop on Absolute Alcohol, Ether, or Benzine, to remove grease. Let the finger then be held in a bowl of Mercury until the ring is sufficiently corroded to break. This only takes a few minutes, *but it of course involves the destruction of the ring.*

If a Brass Ring, wash the grease away as before, scrape the surface with a knife or file, drop on a little dilute acid of any kind, and hold finger in a bowl of Mercury as before.

Re-Silvering Mirror

If the mirror is a large one it is work for experts. If, however, the mirror is small, the following procedure will produce a satisfactory article, provided the directions are closely followed: Dissolve Silver Nitrate, 1, in distilled water, 8, and divide the liquid into two equal parts. To one add sufficient solution of Ammonia to redissolve the precipitate first formed, and to the clear solution add pure Caustic Potash, 1, dissolved in distilled water, 16. Redissolve any precipitate which remains on standing by the cautious addition of Ammonia, stirring well. Then add the rest of the Silver solution and make up to 200 fluid parts with more water. Now make a solution of Sugar of Milk, 1, in water, 20; add a few drops of 90 per cent. Alcohol and mix the solutions. Before using, the glass to be silvered should be thoroughly cleaned, and freed from greasiness especially. The glass is immersed in the liquid in a warm place until well coated. It is then taken out and washed and one side cleaned of the coating. The Silver solution will keep, but the reducing solution should be freshly prepared. When the coating is thoroughly dry it should be backed with a coating of Japan black or some other suitable black pigment.

Solution for Silvering Glass

Pass absolutely dry Ammonia Gas through pure Aldehyde until saturated. Take of this 2·5 grammes and of

Pure Silver Nitrate . . 4 grammes

Dissolve each in sufficient distilled water to produce 1 litre. Mix. Filter.

Place the glass (absolutely free from soap and grease) in the solution, and heat very slowly to 50° C.

When the deposit is thick enough, remove from the liquid, rinse, and set aside to dry.

To Revive Drooping Flowers

Place them in the following solution :

Acetyl-Salicylic Acid . .	30 gr.
Water	1 pint

Salt of Lemon

(*a*) Potassium Binoxalate.

(*b*) Potassium Binoxalate . .	1 part
Cream of Tartar . .	1 „

NOTE.—Do *not* perfume with lemon. Both are poisonous.

Smoke Cartridges for Testing Drains

Saltpetre	1 oz.
Manganese Dioxide . .	½ „
Rosin	½ „
Asphaltum	¼ „

Soap Solution for Blowing Bubbles

1. Sodium Oleate, recently made ½ oz.
   Glycerin . . . . 4 fl. oz.
   Distilled Water . . to 1 pint
2. Oleic Acid . . . 150 gr.
   Sodium Hydroxide Solution N/1 . . . . 9 fl. dr.
   Glycerin . . . . 6 fl. oz.
   Strong Solution of Ammonia 3 drops
   Distilled Water . . to 1 pint

Soldering Glass

Melt together 95 of tin and 5 of copper, stir well with a piece of wood. This unites glass very firmly. Half per cent. of zinc or lead renders the mixture more or less hard.

Soluble Oil for Screw Cutting

Mineral Oil	13 parts fl.
Rosin Oil	3 ,,
Olive Oil	4 ,,

Warm to 120° F., and add the following solution in a thin stream, stirring constantly, until a clear solution is obtained—

Solution of Caustic Potash (sp. gr. 1·40)	equal parts
Industrial Alcohol (95 per cent. vol.)	equal parts

Stage Smoke

Perhaps the best non-irritating ' smoke ' for theatrical purposes is that obtained by bringing the vapour of strong Hydrochloric Acid into contact with the vapour of strong Ammonia, as is done in the Ammonium Chloride inhaler. If, however, something more realistic is required, try the following—

Potassium Nitrate	20 parts
Manganese Dioxide	10 ,,
Rosin	10 ,,
Asphaltum	5 ,,

Sprinkle on a flame or glowing coals. The smoke must be conveyed away from the auditorium.

Staining Billiard Balls

Thoroughly clean the balls with soap and water. Dry by shaking in perfectly new and clean sawdust. With a pair of forceps transfer to a vessel containing Benzine. Allow to soak for a few minutes ; remove with forceps and rinse with fresh Benzine. Remove with forceps, allow to dry ; plunge into distilled water, containing 1 per cent. of Tin Protochloride in solution, for five minutes ; without drying, soak in Methylated Spirit Solution of any Aniline Dye.

Storm Glass, or Fitzroy Barometer

Camphor	2½ dr.
Saltpetre	38 gr.
Ammonium Chloride	38 ,,
Distilled Water	9 fl. dr.
Rectified Spirit	6 ,,

Dissolve by gentle heat.

The following is an *interpretation* of the various changes which take place in the liquid of a chemical barometer: When the solid matter appears soft and powdery and almost filling the tube, rain with south or south-west winds is indicated; when crystalline, north, north-east, or north-west winds, with fine weather may be expected; when a portion crystallises on one side of the tube wind may be expected from that direction. Fine weather: The substance remains entirely at the bottom of the tube and the liquid perfectly clear. Coming rain: The substance will rise gradually, the liquid will be very clear, with small stars in motion. A coming storm of very high wind: Substance partly at the top of the tube and of a leaf-like form, liquid very heavy and in a 'fermenting' state. These effects are observable twenty-four hours in advance. In winter the substance generally lies higher in the tube. Snow or white frost: Substance very white and small stars in motion.

Cobalt Hygrometer

Dip white blotting paper into the following mixture—

Cobalt Chloride . . .	1 oz.
Sodium Chloride. . .	1 ,,
Glycerin	2 drops
Mucilage of Acacia . .	1 fl. dr.
Distilled Water . . .	5 fl. oz.

Exposed to the atmosphere, the paper becomes more or less reddish in proportion to the moisture present.

Removing Tattoo Marks

The following applications have been suggested but cannot be guaranteed—

1. Papain . . . . 5 parts
   Water . . . . 25 ,,
   Glycerin . . . . 75 ,,
   Dilute Hydrochloric Acid . 1 ,,

Rub the Papain with the water and Hydrochloric Acid, allow the mixture to stand for one hour, add the Glycerin, stand for three hours, and filter.

2. Salicylic Acid massed with Glycerin to the consistence of dough applied over the marks with a compress and strips of adhesive plaster, and allowed to remain in contact for some time. After the first dressing the epidermis over the marks is removed, and a fresh application of the Salicylic paste applied. Usually the second application removes the marks, but sometimes it is necessary to make a third. The treatment must be applied very cautiously.

Touch Paper

Soak blotting paper (or other unsized paper) in 10 per cent. solution of Potassium Nitrate. Drain and dry perfectly.

Tracing Paper Preparation

(*a*)	Oil of Turpentine . .	6 parts
	Rosin	1 part
	Boiled Nut Oil . . .	1 ,,
(*b*)	Canada Balsam, Oil of Turpentine . .	equal parts

To Whiten Tennis Balls

Light Carbonate of Magnesia	3 oz.
Benzol	½ fl. oz.
Liquid Paraffin . . .	½ ,,
Tragacanth . .	40 gr.
Methylated Spirit . .	½ fl. oz.
Water	2 pints

Mix the Benzol, Liquid Paraffin, Tragacanth and Spirit. Add to this, all at once, the mixture of Magnesia and water. Shake well. Clean the balls thoroughly, dip in the mixture. Dry in a warm place and shake together.

Examination of Writing for Forgeries

If a forger has used a different ink from that used in the original document, it may be detected as follows—

1. Dilute Sulphuric Acid
2. Concentrated Hydrochloric Acid
3. Dilute Nitric Acid
4. Sulphurous Acid
5. Solution of Caustic Soda
6. Concentrated Solution of Oxalic Acid
7. Solution of Chlorinated Lime
8. Solution of Tin Protochloride

Take eight new quill pens, one for each reagent, and with a rule draw lines crossing the original and the suspected writing. Any difference in inks will generally become apparent.

Restoration of Faded Writing

The possibility of restoring faded writing depends on the chemical composition of the ink, on the cause of fading and sometimes on the nature of the material on which the writing existed. If the ink consisted of Aniline colours it can rarely be restored. A very fugitive ink, sometimes used for fraudulent purposes, consists of

Iodide of Starch ; this can be restored by exposure to Iodine vapour, or by treatment with a solution of Iodine and Potassium Iodide. Inks made with an iron basis are restored fairly readily. These are usually treated with solutions of Tannin, Ammonium Sulphide, Potassium Ferrocyanide, Ammonium Sulphocyanide or Sodium Salicylate. Before and after applying solutions the paper should be dried by placing between two sheets of clean blotting paper and ironing with a hot iron.

PART III

PHOTOGRAPHIC FORMULARY

AUTOTYPE FORMULAS

Carbro Concentrated Solution, No. 1.

Potassium Bichromate	1 oz.
,, ,, Ferricyanide	1 ,,
,, ,, Bromide	1 ,,
Distilled Water	1 pint

Carbro Concentrated Solution, No. 2.

Glacial Acetic Acid	1 fl. oz.
Pure Hydrochloric Acid	1 ,,
Solution of Formaldehyde (40 per cent.)	22 ,,

In cold weather add 1¼ fl. oz. distilled water to prevent precipitation.

Sensitising Bath :

Stock Solution No. 1	6 fl. oz.
Water	18 ,,

Acid-formalin Bath :

Stock Solution No. 2	1 fl. oz.
Water	32 ,,

ELLIOTT & SONS' FORMULAS

Barnet Plates

Pyro-Soda Developer

A.	Stock Solution	2 fl. oz.
	Distilled Water	18 ,,
B.	Sodium Carbonate, Crystals	2 oz.
	,, Sulphite Crystals	2¼ ,,
	Distilled Water to	1 pint

Stock Solution :

Potassium Metabisulphite	100 gr.
Pyro	1 oz.
Potassium Bromide . .	1 dr.
Distilled Water . . to	8 fl. oz.

Mix equal parts A and B.

For over exposure use more of A solution and add a few drops of a 10 per cent. solution Potassium Bromide. For under exposure take more of B solution.

Metol-Hydroquinone Developer

Metol	45 gr.
Hydroquinone . . .	45 ,,
Sodium Sulphite Crystals .	500 ,,
Sodium Carbonate Crystals .	500 ,,
Potassium Bromide . .	25 ,,
Distilled Water . . to	1 pint

Fixing Bath :

Hypo	½ lb.
Water	1 pint

Fixing and Hardening Bath :

Hypo	½ lb.
Water	16 fl. oz.

Dissolve and add the following solution—

Sodium Sulphite Crystals .	½ oz.
Alum	½ ,,
Acetic Acid . .	3 fl. dr.
Water	2½ fl. oz.

Barnet Cold Tone Lantern Plates

Developer

A.	Hydroquinone . . .	150 gr.
	Potassium Metabisulphite .	10 ,,
	Potassium Bromide . .	50 ,,
	Distilled Water . . to	1 pint
B.	Sodium Sulphite Crystals .	2 oz.
	Sodium Hydroxide . .	100 gr.
	Distilled Water . . to	1 pint

Mix equal parts A and B.

Fixing Solution :

Hypo	10 oz.
Potassium Metabisulphite .	½ ,,
Alum	1 ,,
Water . . . to	25 fl. oz.

Barnet Gaslight Lantern Transparency Plates

Developer for Black Tones

Metol		10 gr.
Sodium Sulphite Crystals		300 ,,
Hydroquinone		25 ,,
Sodium Carbonate Crystals		600 ,,
Potassium Bromide		10 ,,
Distilled Water	to	1 pint

Dissolve in this order.

For warmer tones, brown to sepia, the following restrainer is recommended—

Ammonium Carbonate	1 oz.
Ammonium Bromide	1 ,,
Water	10 fl. oz.

Use 1 to 2 fl. dr. to each ounce of developer according to the tone desired.

Developer for Warm Tones

Eikonogen		30 gr.
Hydroquinone		10 ,,
Sodium Sulphite Crystals		160 ,,
Potassium Carbonate		80 ,,
Potassium Bromide		15 ,,
Citric Acid		20 ,,
Distilled Water	to	1 pint

Fixing Bath :

Hypo	5 oz.
Potassium Metabisulphite	½ ,,
Water	25 fl. oz.

Barnet Bromide Papers

Amidol Developer

Amidol		50 gr.
Sodium Sulphite Crystals		650 ,,
Potassium Bromide		10 ,,
Distilled Water	to	1 pint

Should be used within three days of mixing.

Metol Developer

A. Metol		400 gr.
Sodium Sulphite Crystals		8 oz.
Potassium Bromide		50 gr.
Distilled Water		4 pints
B. Potassium Carbonate		8 oz.
Distilled Water		4 pints

Mix 3 parts A and 1 part B. This keeps well.

Metol-Hydroquinone Developer

Metol	200 gr.
Sodium Sulphite Crystals	6 oz.
Hydroquinone	150 gr.
Potassium Carbonate	2 oz.
Potassium Bromide	50 gr.
Distilled Water	4 parts

Keeps indefinitely if well corked.

Fixing Bath :

Hypo	4 oz.
Water	2 pints

Acid Fixing Bath :

Hypo	4 oz.
Potassium Metabisulphite	½ ,,
Water	2 pints

Fixing and Hardening Bath :

Hypo	½ lb.
Water	32 fl. oz.

Dissolve and add the following solution—

Sodium Sulphite Crystals	½ oz.
Alum	½ ,,
Glacial Acetic Acid	3 fl. dr.
Water	2½ fl. oz.

Sulphide Toning Bath :

A.	Potassium Bromide	100 gr.
	Potassium Ferricyanide	75 ,,
	Distilled Water	10 fl. oz.
B.	Sodium Sulphide	1 oz.
	Distilled Water	10 fl. oz.
C.	Solution B	1 fl. oz.
	Distilled Water	1 pint

Immerse the fixed and well washed prints in Solution A until the image is bleached, then rinse in cold water till the yellow colour is discharged from the white parts of the print. Next immerse in Solution C for one or two minutes, and wash for one hour in repeated changes of water.

Solution A may be used repeatedly if kept well corked.

Solution C must be used once only.

Hot Hypo Alum Toning Bath for Sepia or Brown Tones

Hot Water	20 oz.
Hypo	2½ ,,

Dissolve and add—

Alum	1 oz.
Sugar	1 ,,

This bath should not be filtered, and works better as it gets older. It may be strengthened from time to time with a little fresh solution.

Take the fixed and washed prints and place them in—

Alum	1 oz.
Water	20 ,,

for ten minutes, rinse in a few changes of water, and immerse in the above bath, which has been previously heated to 120° F. (as hot as the hand can bear) and keep them moving the whole time.

They will take about forty minutes to tone. When toned place them in a tepid alum solution of the following strength for about ten minutes, then wash and dry—

Alum	1 oz.
Water	30 ,,

The hypo alum bath when new tends to reduce the prints a good deal, and this must be allowed for when developing. This bath is greatly improved by soaking a few pieces of P.O.P. paper in it before use. Stale paper will do.

The tones given by this bath are much colder than by the sulphide method.

'Verona' Chloro-bromide Paper

Amidol Developer

Sodium Sulphite Crystals	2½ oz.
Distilled Water	4 pints

When dissolved, add—

Amidol	240 gr.
Potassium Bromide	40 ,,

Should be used within three days of mixing.

Metol-Hydroquinone Developer

Metol	30 gr.
Hydroquinone	120 ,,
Sodium Sulphite Crystals	3 oz.
Sodium Carbonate	4 ,,
Potassium Bromide	120 gr.
Distilled Water	4 pints

Metol-Hydroquinone Developer

(For Soft Negatives)

Metol	60 gr.
Hydroquinone	240 ,,
Sodium Sulphite Crystals	4 oz.
Sodium Carbonate Crystals	7 ,,
Potassium Bromide	1¼ ,,
Distilled Water	4 pints

New Developer for Warmer Blacks

Metol	30 gr.
Sodium Sulphite Crystals	1¾ oz.
Hydroquinone	120 gr.
Sodium Carbonate Crystals	1¾ oz.
Distilled Water	2 pints

Mix 1 pint with 1 pint of water and 3 oz. of 10 per cent. Solution Potassium Bromide.

Fixing Bath :

Hypo	12 oz.
Potassium Metabisulphite	½ ,,
Water	4 pints

Toning Bath :

Hot Hypo-Alum Process

(For Sepia or Brown Tones)

Hypo	2½ oz.
Hot Water	1 pint

Dissolve and add—

Alum	½ oz.
Sugar	½ ,,

For details of process, *see* under Barnet Bromide Papers.

Liver of Sulphur Process

Liver of Sulphur	60 gr.
Water	4 pints

Use at about 80° F.

Sulphide Toning Bath :

See under Barnet Bromide Papers.

Bar-Gas Paper

Metol-Hydroquinone Developer

Metol	8 gr.
Hydroquinone	30 ,,
Sodium Sulphite Crystals	350 ,,
Sodium Carbonate Crystals	300 ,,
Potassium Bromide	3 ,,
Distilled Water	10 fl. oz.

Acid Fixing Bath :

Hypo	3 oz.
Sodium Metabisulphite	¼ ,,
Water	1 pint

Barnet-Bromoil Process

Developer :

Sodium Sulphite, anhydrous	½ oz.
Amidol	40 gr.
Potassium Bromide	2 ,,
Distilled Water	1 pint

Fixing Bath :

Hypo	4 oz.
Water	1 pint

Bleaching Bath :

Copper Sulphate Crystals	½ oz.
Potassium Bromide	½ ,,
Potassium Bichromate	16 gr.
Glacial Acetic Acid	20 min.
Distilled Water	1 pint

Mix 1 part with 2 parts tepid water.

Acid Bath :

Sulphuric Acid, pure	1 fl. dr.
Water	1 pint

Fixing Bath :

As above.

ILFORD FORMULAS

Ilford Plates and Roll Films

Pyro Soda Developer

Stock Pyro 10 per cent. Solution :

Pyrogallic Acid	1 oz.
Potassium Metabisulphite	100 gr.
Water to	10 oz.

1.	Stock Pyro Solution	2 oz.
	Water to	20 ,,
2.	Sodium Carbonate Crystals	2 oz.
	Sodium Sulphite Crystals	2 ,,
	Potassium Bromide (10 per cent. Solution)	2 dr.
	Water to	20 oz.

For use mix equal parts of Nos. 1 and 2.

Metol-Hydroquinone Developer

Metol	20 gr.
Sodium Sulphite Crystals	2 oz.
Hydroquinone	80 gr.
Sodium Carbonate Crystals	2 oz.
Potassium Bromide (10 per cent. Solution)	80 min.
Water to	20 oz.

Dissolve the ingredients in the order given. For *dish* development dilute 1 part with 2 parts of water. For *tank* development dilute 1 part with 10 parts of water.

Metol-Pyro Developer

1.	Metol	35 gr.
	Potassium Metabisulphite	100 ,,
	Pyrogallic Acid	100 ,,
	Water to	20 oz.
2.	Sodium Carbonate Crystals	4 oz.
	Water to	20 ,,

Dissolve in the order given. For use mix equal quantities of Nos. 1 and 2.

Ilford Process, Half-tone and Process Panchromatic Plates

Developer

1.	Hydroquinone	1 oz.
	Potassium Metabisulphite	1 ,,
	Potassium Bromide	1 ,,
	Water to	40 ,,
2.	Potassium Hydrate (Stick)	2 oz.
	Water to	40 ,,

For use mix equal parts of Nos. 1 and 2. Development should be completed within three minutes at 65° F. Rinse well between developing and fixing.

Fixing Bath :

Sodium Hyposulphite	1 lb.
Water to	40 oz.

Alternative Fixing Bath (Hardening) :

Potassium Metabisulphite	2 oz.
Chrome Alum	70 gr.
Sodium Hyposulphite	1 lb.
Water to	40 oz.

Dissolve in the order given.

Clearing Solution :

Potassium Ferricyanide	4 oz.
Water to	20 ,,

For use, add a few drops of this solution to each ounce of the fixing solution, and to each part of the mixture add 3 parts of water.

Intensifier :

1.	Mercuric Chloride	100 gr.
	Potassium Bromide	100 ,,
	Water to	10 oz.

2. Ammonia ·880 . . . 1 oz.
Water . . . to 10 ,,

Wash the hypo thoroughly out of the plate, then bleach in No. 1 solution, and blacken in No. 2.

Ilford Special Lantern Plates

Hydroquinone Developer for Black Tones

1. Hydroquinone . . . 160 gr.
Sodium Sulphite Crystals . 2 oz.
Water . . . to 20 ,,

2. Sodium Hydrate . . 90 gr.
Potassium Bromide . . 35 ,,
Water . . . to 20 oz.

Use equal parts of No. 1 and No. 2.

Pyro Developer for Black and Sepia Tones

A. Pyrogallic Acid . . . 100 gr.
Potassium Metabisulphite . 35 ,,
Water . . . to 20 oz.

B. Sodium Carbonate Crystals . 2 oz.
Sodium Sulphite Crystals . 2 ,,
Potassium Bromide . . 20 gr.
Water . . . to 20 oz.

C. Ammonium Carbonate (fresh) 1 oz.
Ammonium Bromide . . 1 ,,
Water . . . to 10 ,,

For *Black* tones use 8 parts A and 8 parts B. For *Cold Sepia* add to this 1 part C, for *Warm Sepia* 2 parts C and for *Purple* 4 parts C. Much longer exposure and development are required for sepia and purple than for black tones.

Ilford Alpha Lantern Plates

The only suitable Developer

1. Hydroquinone . . . 100 gr.
Sodium Sulphite Crystals . 1 oz.
Water . . . to 20 ,,

2. Sodium Carbonate Crystals . 1¼ oz.
Potassium Bromide . . 35 gr.
Water . . . to 20 oz.

Use equal parts of No. 1 and No. 2. Rinse well and fix in Sodium Hyposulphite 3 oz., Water to 20 oz.

A *Red* tone is obtained by short development of a full exposure and a *Greenish* tone by prolonged development of a short exposure, while *Sepia* comes between these extremes. The image becomes colder and denser on

drying. The colour may be modified if desired by toning in the following bath—

Sodium Hyposulphite .	1½ oz.
Ammonium Sulphocyanide .	¼ ,,
Gold Chloride . . .	4 gr.
Water . . . to	10 oz.

Dissolve in the order given. The bath keeps indefinitely, and may be used repeatedly if replenished with a double strength bath.

In the toning bath a *Red* coloured slide changes gradually through *Brown* to *Purple* and finally to *Blue*.

Ilford Bromide Papers

Metol-Hydroquinone Developer

Metol	7 gr.
Sodium Sulphite Crystals .	½ oz.
Hydroquinone . . .	35 gr.
Sodium Carbonate Crystals .	¾ oz.
Potassium Bromide . .	10 gr.
Water . . . to	20 oz.

Amidol or Diamidophenol Developer

Sodium Sulphite Crystals .	1 oz.
Amidol, or Diamidophenol .	50 gr.
10 per cent. Solution of Bromide of Potassium .	80 min.
Water . . . to	20 oz.

Dissolve in the order given in warm water and use when cold.

Ilford Gaslight Papers

Metol-Hydroquinone Developer

Metol	10 gr.
Sodium Sulphite Crystals .	1 oz.
Hydroquinone . . .	35 gr.
Sodium Carbonate Crystals .	1 oz.
10 per cent. Solution of Potassium Bromide . .	20 min.
Water . . . to	20 oz.

Amidol or Diamidophenol Developer

Sodium Sulphite Crystals .	1 oz.
Amidol or Diamidophenol .	50 gr.
10 per cent. Solution of Bromide of Potassium .	15 min.
Water . . . to	20 oz.

Dissolve in the order given in warm water and use when cold.

Ilford P.O.P. Toning Bath

Sulphocyanide Solution

Ammonium Sulphocyanide	.		100 gr.
Water	. .	to	10 oz.

Gold Solution

Gold Chloride	. .	.	15 gr.
Water	. .	to	15 oz.

Toning Bath : To 16 oz. of Water add 2 oz. of Sulphocyanide Solution, followed by 2 oz. of Gold Solution.

The prints should be withdrawn while there is still a little warmth left in the deepest shadows on looking through the prints. The strength of the bath should be kept up by the addition of Gold Solution, so that toning is completed in from five to ten minutes. A fresh bath should be used for each batch of prints.

This quantity of bath will tone about $1\frac{1}{4}$ sheets, or 16 pieces of half-plate size.

Ilford Self-toning Papers

Intona (*Gelatin*)

Fix by placing the prints direct, *without previous washing*, in—

Sodium Hyposulphite	.	.	6 oz.
Water	. .	to	20 ,,

for from five to ten minutes, avoiding air bubbles and keeping them in constant motion. To insure fixation not less than five minutes should be allowed.

Hyptona (*Collodion*)

For Brown Tones : *Wash* for five minutes. *Fix* for ten minutes in—

Sodium Hyposulphite	.		2 oz.
Water	. .	to	20 ,,

It is advisable to add 10 gr. Sodium Carbonate to the above bath. Use a fresh fixing bath for each batch of prints.

For Purple Tones : Place the prints *without previous washing* for five minutes in a bath of Common Salt 1 oz. ; Water up to 10 oz., then rinse, and fix as above.

For Sepia Tones : Wash for five minutes and tone in the following bath—

Potassium Chloroplatinite	.		2 gr.
Citric Acid	. .	.	40 ,,
Water	. .	to	10 oz.

THE IMPERIAL DRY PLATE CO.'S FORMULAS

Pyro-Soda Developer

Stock Solution :

Potassium Metabisulphite	50 gr.
Pyro	1 oz.
Potassium Bromide	60 gr.
Distilled Water to	12 fl. oz.

A. Stock Solution	3 fl. oz.
Distilled Water to	1 pint
B. Sodium Sulphite Crystals	2 oz.
Sodium Carbonate Crystals	2 ,,
Distilled Water to	1 pint

Mix equal parts A and B.

"*Standard*" *Developer*

A. Metol	45 gr.
Potassium Metabisulphite	120 ,,
Pyro	55 ,,
Potassium Bromide	20 ,,
Distilled Water to	1 pint
B. Sodium Carbonate Crystals	4 oz.
Distilled Water to	1 pint

Mix equal parts A and B.

"*Single Solution*" *Developer*

Metol	50 gr.
Sodium Sulphite Crystals	500 ,,
Sodium Carbonate Crystals	500 ,,
Hydroquinone	40 ,,
Potassium Bromide	25 ,,
Distilled Water to	1 pint

"*Universal*" *Developer*

A. Metol	40 gr
Sodium Sulphite Crystals	120 ,,
Hydroquinone	50 ,,
Potassium Bromide	15 ,,
Distilled Water to	1 pint
B. Potassium Hydroxide	180 gr.
Distilled Water to	1 pint

Mix equal parts A and B.

Hydroquinone Developer

A.	Potassium Metabisulphite	10 gr.
	Hydroquinone	150 ,,
	Potassium Bromide	50 ,,
	Distilled Water	to 1 pint
B.	Sodium Sulphite, Crystals	2 oz.
	Sodium Hydroxide	100 gr.
	Distilled Water	to 1 pint

Mix equal parts A and B.

Developer for Imperial Eclipse Plates

Metol	20 gr.
Hydroquinone	40 ,,
Potassium Metabisulphite	120 ,,
Sodium Carbonate Crystals	1½ oz.
Potassium Bromide	3 gr.
Distilled Water	to 1 pint

Mix 1 part with 2 or 3 parts water. Develop at 70° F.

KOSMOS FORMULAS

Vitegas Developer, No. 1

Metol	20 gr.
Hydroquinone	60 ,,
Sodium Sulphite, Crystals	¾ oz.
Sodium Carbonate Crystals	1 oz. 3 dr.
Potassium Bromide	12 gr. to 24 gr.
Distilled Water	25 fl. oz.

Keeps well.

Vitegas Developer, No. 2

Sodium Sulphite Crystals	1 oz.
Diamidophenol	100 gr.
Potassium Bromide	12 gr. to 24 gr.
Distilled Water	20 fl. oz.

Will not keep for more than two days.

Vitegas Developer, No. 3

Metol	60 gr.
Hydroquinone	240 ,,
Potassium Bromide	¼ oz.
Sodium Sulphite Crystals	4 ,,
Sodium Carbonate Crystals	7 ,,
Distilled Water	4 pints

Gives colder blacks than No. 1 and No. 2.

Vitegas Developer, No. 4

Ammonium Bromide	44 gr.
Potassium Bromide	88 ,,
Vitegas Developer, No. 1	32 fl. oz.

Gives extra warm prints

Vitegas Fixing Bath :

Hypo	5 oz.
Potassium Metabisulphite	¼ ,,
Water	1 pint

Vitegas Sulphide Toning Method

Bleaching Bath :

Potassium Ferricyanide	1½ oz.
Potassium Bromide	1½ ,,
Solution of Ammonia 0·880	1 fl. oz.
Distilled Water	2 pints

Sulphide Bath :

Sodium Sulphide	80 gr.
Distilled Water	1 pint

Vitegas Liver of Sulphur Toning Method

Liver of Sulphur	1 dr.
Solution of Ammonia 0·880	2 fl. dr.
Distilled Water	4 pints

Vitegas Hypo-Alum Toning Method

For this process the prints are not fixed. They are slightly rinsed after development and put into the following bath—

Hypo	5 oz.
Alum	1 ,,
Boiling Water	2 pints

Cool before use.

Allow the prints to stand for about one hour to fix ; then raise the temperature to 115° F. When properly toned, drain and cool the prints, then transfer to the following solution—

Alum	2 oz.
Water	3 pints

Novex M.Q. Developer

Metol	16 gr.
Hydroquinone	60 ,,
Sodium Sulphite Crystals	1 oz.
Sodium Carbonate Crystals	1¾ ,,
Potassium Bromide	3 gr.
Distilled Water	1 pint

Novex Amidol Developer

Sodium Sulphite Crystals	1 oz.
Amidol	100 gr.
Potassium Bromide	12 gr. to 24 gr.
Distilled Water	1 pint

Novex Fixing Bath :

Hypo	5 oz.
Potassium Metabisulphite	½ ,,
Water	1 pint

Novex Sulphide Toning Method

Bleaching Bath :

Potassium Ferricyanide	½ oz.
Potassium Bromide	½ ,,
Distilled Water	1 pint

Sulphide Bath :

Sodium Sulphide	80 gr.
Distilled Water	1 pint

GENERAL DEVELOPERS

Amidol

1.	Amidol	1 dr.
	Sodium Sulphite	1 oz.
	Distilled Water to	1 pint
2.	Amidol	50 gr.
	Sodium Sulphite	1½ oz.
	Potassium Bromide	10 gr.
	Distilled Water to	1 pint

Glycin

Glycin	40 gr.
Sodium Sulphite	100 ,,
Potassium Carbonate	250 ,,
Distilled Water to	1 pint

Glycin-Hydroquinone

A.	Glycin	3 dr.
	Hydroquinone	1 ,,
	Potassium Carbonate	3 ,,
	Sodium Sulphite Crystals	2 oz.
	Warm Distilled Water to	10 fl. oz.
B.	Potassium Carbonate	2 oz.
	Distilled Water to	10 fl. oz.

Mix equal parts A, B, and water.

Ferrous Oxalate

A.	Potassium Citrate	4½ oz.
	Potassium Oxalate	1¼ ,,
	Distilled Water	10 fl. oz.
B.	Ferrous Sulphate	2 oz.
	Distilled Water	10 fl. oz.

Mix equal parts A and B.

Hydroquinone

One-solution :

Hydroquinone	100 gr.
Sodium Sulphite	1½ oz.
Sodium Carbonate Crystals	3 ,,
Distilled Water to	1 pint

Two-solution—Concentrated :

A.	Hydroquinone	480 gr.
	Sulphurous Acid	3½ fl. oz.
	Rectified Spirit	3½ ,,
	Distilled Water to	1 pint
B.	Sodium Hydroxide	480 gr.
	Sodium Sulphite	480 ,,
	Distilled Water to	1 pint

Use A 1 part, B 1 part, Water 8 parts.

Hydroquinone-Formalin

1.	Hydroquinone	2 dr.
	Sodium Sulphite	6 oz.
	Formalin	3 fl. dr.
	Distilled Water to	1 pint
2.	Hydroquinone	½ oz.
	Sodium Sulphite	5 ,,
	Formalin	½ fl. oz.
	Distilled Water to	1½ pint.

Metol

One-solution :

Metol	75 gr.
Sodium Sulphite	1¼ oz.
Sodium Carbonate Crystal	1¾ ,,
Potassium Bromide	6 gr.
Distilled Water to	1 pint

Two-solution :

A.	Metol		75 gr.
	Sodium Sulphite		1¼ oz.
	Distilled Water	to	10 fl. oz.
B.	Sodium Carbonate Crystals		1¾ oz.
	Potassium Bromide		6 gr.
	Distilled Water	to	10 fl. oz.

Mix equal parts A and B.

Metol-Hydroquinone

One-solution :

1.	Metol		15 gr.
	Hydroquinone		40 ,,
	Sodium Sulphite Crystals		1 oz.
	Sodium Carbonate Crystals		1½ ,,
	Potassium Bromide		5 gr.
	Distilled Water	to	1 pint
2.	Metol		20 gr.
	Hydroquinone		20 ,,
	Sodium Sulphite Crystals		1 oz.
	Sodium Carbonate Crystals		¾ ,,
	Distilled Water	to	1 pint

Two-solution :

A.	Metol		20 gr.
	Hydroquinone		25 ,,
	Sodium Sulphite Crystals		1 dr.
	Potassium Bromide		7 ,,
	Distilled Water	to	10 fl. oz.
B.	Potassium Hydroxide		1½ dr.
	Distilled Water	to	10 fl. oz.

Mix equal parts A and B.

Concentrated 1 = 16 :

	Metol		24 gr.
	Hydroquinone		96 ,,
	Warm Distilled Water		4 fl. oz.

Dissolve, and add—

	Sodium Sulphite, powdered crystals		1½ oz.

Mix, dissolve and add—

	Sodium Hydroxide		64 gr.

Metol-Pyro-Hydroquinone

Metol		6 gr.
Pyro		20 ,,
Hydroquinone		20 ,,
Sodium Sulphite Crystals		1 oz.
Sodium Carbonate Crystals		1 ,,
Distilled Water	to	1 pint

Ortol

A. Ortol		70 gr.
Potassium Metabisulphite		35 ,,
Distilled Water	to	10 fl. oz.
B. Sodium Carbonate Crystals		1¼ oz.
Sodium Sulphite Crystals		1¼ ,,
Distilled Water	to	10 fl. oz.

Use equal parts A and B.

Para-amido-phenol

One-solution :

Para-amido-phenol		40 gr.
Potassium Metabisulphite		130 ,,
Hot Distilled Water		1 pint

Dissolve, and add strong Potassium Hydroxide Solution until the precipitate formed just re-dissolves.

Concentrated 1 = 20 :

Para-amido-phenol		2 oz.
Potassium Metabisulphite		6 ,,
Boiling Distilled Water		1 pint
Strong Potassium Hydroxide Solution		a sufficiency

Two-solution :

A. Para-amido-phenol Hydrochloride		100 gr.
Potassium Metabisulphate		50 ,,
Distilled Water	to	10 fl. oz.
B. Sodium Sulphite Crystals		1¼ oz.
Potassium Carbonate		1¼ ,,
Distilled Water	to	10 fl. oz.

Mix equal parts A, B, and water.

Pyro-Acetone

Pyro		50 gr.
Sodium Sulphite Crystals		1¼ oz.
Acetone		1¼ fl. oz.
Distilled Water	to	1 pint

Concentrated :

A. Pyro . . . . 1¼ oz.
Sodium Sulphite Crystals . 4 ,,
Distilled Water . . to 9 fl. oz.

B. Acetone.

Mix 1 part A, 1 part B, and 10 parts water.

Pyro-Ammonia

A. Pyro . . . . 1 oz.
Citric Acid . . . 20 gr.
Sodium Sulphite Crystals . 2 oz.
Distilled Water . . to 10 fl. oz.

B. Solution of Ammonia, 0·880 1 fl. oz.
Distilled Water . . to 10 ,,

C. Ammonium Bromide . . 1 oz.
Distilled Water . . to 10 fl. oz.

Mix 10 min. each A and B, 5 min. C, and water to 1 fl. oz.

Pyro-Metol

A. Pyro . . . . 28 gr.
Metol . . . . 22 ,,
Potassium Metabisulphite . 1 dr.
Potassium Bromide . . 8 gr.
Distilled Water . . to 10 fl. oz.

B. Potassium Hydroxide . . 1½ dr.
Distilled Water . . to 10 fl. oz.

Mix equal parts A and B.

Pyro-Soda

A. Pyro . . . . 45 gr.
Potassium Metabisulphite . 10 ,,
Distilled Water . . to 10 fl. oz.

B. Sodium Carbonate Crystals . 1¾ oz.
Sodium Sulphite Crystals . ½ ,,
Distilled Water . . to 10 fl. oz.

Use equal parts A. and B.

A. Pyro . . . . 1 oz.
Potassium Metabisulphite . ½ ,,
Citric Acid . . . 1 dr.
Potassium Bromide . . 30 gr.
Distilled Water . . to 10 fl. oz.

B Sodium Carbonate Crystals . 8 oz.
Distilled Water . . to 1 pint

Mix 1 part A, 7 parts water, and 8 parts B.

Concentrated :

A. Pyro . . . . 1 oz.
Sodium Sulphite Crystals . 2 ,,
Citric Acid . . . 40 gr.
Distilled Water . . to 10 fl. oz.

B. Sodium Carbonate Crystals . 2 oz.
Sodium Sulphite Crystals . 2 ,,
Distilled Water . . to 10 fl. oz.

Mix 1 part A, 4 parts B, and 12 parts water.

FIXING BATHS

Acid Fixing Bath

1. Hypo . . . . 4 oz.
Potassium Metabisulphite . ½ ,,
Water . . . to 1 pint

2. Hypo . . . . 4 oz.
Acetone Sulphite . . ¼ ,,
Water . . . to 1 pint

Fixing Hardening Bath

1. Chrome Alum . . . 1 dr.
Hypo . . . . 5 oz.
Sodium Acetate . . . ½ ,,
Water . . . to 1 pint

Make a separate solution of each solid, then mix the resulting solutions.

2. A. Sodium Sulphite Crystals . 2 oz.
Glacial Acetic Acid . . 1½ fl. oz.
Alum . . . . 2 oz.
Warm Water . . . 10 fl. oz.

B. Hypo . . . . 2½ oz.
Water . . . 10 fl. oz.

Mix 1 part A and 10 parts B.

INTENSIFIERS

Chromium

Bleaching Solution :

Potassium Bichromate . ½ oz.
Pure Hydrochloric Acid . 2 fl. dr.
Water . . . to 1 pint

Developing Solution :

A. Amidol Developer.

B. Metol-Hydroquinone Developer.

Copper

Bleaching Solution :

A. Copper Sulphate Crystals . 2¼ oz.
Distilled Water, hot . to 10 fl. oz.

B. Potassium Bromide . . 2¼ oz.
Distilled Water . . to 10 fl. oz.

Mix A and B.

Blackening Solution :

Silver Nitrate . . . 1 oz.
Distilled Water . to 10 fl. oz.

Mercury

Bleaching Solution :

Mercuric Chloride . . 2 dr.
Ammonium Chloride . . 1 dr.
Distilled Water . . . 10 fl. oz.

Blackening Solutions :

A. Ferrous Oxalate Developer.

B. Solution of Ammonia, 0·880 20 min.
Water . . . . 1 fl. oz.

C. Sodium Sulphantimoniate . 15 gr.
Water . . . . 1 fl. oz.

D. Any Alkaline Developer.

Uranium

A. Uranium Nitrate . . 100 gr.
Distilled Water . . . 10 fl. oz.

B. Potassium Ferricyanide . 100 gr.
Distilled Water . . . 10 fl. oz.

C. Glacial Acetic Acid.

Mix 4 parts each A and B and 1 part C.

REDUCERS

Cerium

Cerium Sulphate. . . 1 oz.
Sulphuric Acid, Pure . . 20 min.
Distilled Water . . to 10 fl. oz.

Mix 1 part with 9 parts of water.

Permanganate

Potassium Permanganate . 6 gr.
Distilled Water . . . 10 fl. oz.

Dissolve, and add—

Sulphuric Acid, Pure . . 30 min.

Persulphate

1. Ammonium Persulphate . 100 gr.
   Distilled Water . . to 10 fl. oz.

After reduction, place in 5 per cent. Sodium Sulphite Solution.

2. Ammonium Persulphate . 1 oz.
   Sodium Sulphite Crystals . 1½ dr.
   Sulphuric Acid, Pure . . 10 min.
   Distilled Water . . to 10 fl. oz.

After reduction, place in 5 per cent. Sodium Sulphite Solution.

MOUNTANTS

Dextrin

White Dextrin . . . 7 oz.
Water at 160° F. . . 7 fl. oz.

Mix and maintain the temperature as nearly as possible at 160° F. until the dextrin is dissolved. Then add—

Oil of Clove . . . 10 min.
Water . . . to 1 lb.

Stir well and allow to cool.

Gum-Dextrin

White Gum Arabic, powder . 1 oz.
Dextrin . . . . 4½ ,,
Water . . . . 16 fl. oz.

Mix well and boil gently for ten minutes. Cool and add—

Solution of Ammonia, 0·880 . 3 drops
Oil of Clove . . . 10 min.
Methyl Salicylate . . 10 ,,

Starch Gelatin

Good Arrowroot . . ½ lb.
Distilled Water . . . 3 pints

Make a smooth paste with a little of the water; add the remainder, and strain through muslin. Boil for five minutes, keeping well stirred meanwhile.

Gelatin . . . . ¾ oz.
Distilled Water . . . 6 fl. oz.

Soak for an hour; add to the hot starch mucilage. Mix well. Cool, and add—

Methylated Spirit . . 4 fl. oz.
Oil of Clove . . . 1 dr.

MISCELLANEOUS FORMULAS

Negative Varnishes

1.	Sandarac	4 oz.
	90 per cent. Alcohol . .	28 fl. oz.
	Oil of Lavender . . .	3 ,,
2.	Sandarac	1 oz.
	Shellac	1½ ,,
	Castor Oil	3 dr.
	Oil of Lavender . . .	1½ fl. dr.
	90 per cent. Alcohol . .	18 fl. oz.

This may be bleached by filtering through animal charcoal.

Copying

White Lines on Blue Ground

Sensitising Solution :

(*a*)	Potassium Ferricyanide .	35 grammes
	Distilled Water . . .	230 c.c.
(*b*)	Ammonium and Iron Citrate .	53 grammes
	Distilled Water . . .	230 c.c.

Mix equal parts (*a*) and (*b*). Coat the paper, and dry it in the dark.

Expose in the ordinary manner ; wash in water. A little Hydrochloric added to the second wash water gives clearer tones.

Black Lines on White Ground

Sensitising Solution :

(*a*)	Ferric Sulphate . . .	480 gr.
	Distilled Water . . .	6¾ fl. oz.
(*b*)	Tartaric Acid . . .	13 dr.
	Distilled Water . . .	6¾ fl. oz.

Add (*a*) slowly to (*b*), stir well, and add to—

(*c*)	Gum Acacia . . .	13 dr.
	Distilled Water . . .	17 fl. oz.

Mix well, and add very slowly, stirring all the time—

Solution of Ferric Chloride (sp. gr. 1·45) . . .	100 c.c.

Filter in the dark, and keep in a stoppered bottle away from light. This mixture keeps for some time.

Sensitise the paper in a dark room, using ruby light. Dry in warm dark room.

Expose in the usual way to sunlight (five to ten minutes).

Developing Solution :

Tannic Acid	2–3 grammes
Oxalic Acid	0·1 gramme
Distilled Water	1·0 litre

The Pellet Process

A. Gum Acacia	4 oz.
Distilled Water	20 fl. oz.
B. Green Iron and Ammonium Citrate	10 oz.
Distilled Water	20 fl. oz.
C. Ferric Chloride	10 oz.
Distilled Water	20 fl. oz.

Working Solution :

Solution B	8 parts
Solution C	5 ,,
Solution A	20 ,,

Mix in order named, stirring constantly.

Developing Solution : 10 per cent. Solution Potassium Ferrocyanide.

Fixing Solution : 4 per cent. Solution Sulphuric Acid.

Burnishing Liquid for Prints

Castille Soap	20 gr.
Rectified Spirit	10 fl. oz.

Teape's Backing for Plates

Mucilage of Acacia	1 fl. oz.
Caramel	1 oz.
Finely-ground Burnt Sienna	2 ,,
Alcohol	2 fl. oz.

Preparing Prints for Colouring

For Gelatin Prints

Purified Ox Gall	1 dr.
20 per cent. Alcohol	1 pint

Brush the prints and allow to dry.

For Collodion Prints

Saponin	20 gr.
45 per cent. Alcohol	½ pint.

Flashlight Powders

(*These should only be manufactured by experts. On no account must the ingredients be rubbed together or handled roughly.*)

1.	Magnesium, powder	1 part
	Boric Acid	1 ,,
2.	Magnesium, powder	4 parts
	Potassium Permanganate	4 ,,
	Barium Peroxide	2 ,,
3.	Aluminium, powder	5 parts
	Antimony Sulphide	1 part
	Potassium Nitrate	2 parts
	Potassium Chlorate	12 ,,
4.	Potassium Chlorate	30 parts
	Potassium Ferrocyanide	3 ,,
	Aluminium, powder	360 ,,
	Icing Sugar	2 ,,
5.	Magnesium, powder	1 part
	Potassium Nitrate	1 ,,

Dead Black Camera Varnish

The best all-round black varnish for photographer's work is a solution of Celluloid, with enough Lampblack mixed with it to give the desired effect, and with slight modifications this varnish can be adapted to give either a dead black or a semi-bright black finish. It is essential that good quality Lampblack should be used. The Celluloid solution is a simple solution of Celluloid in Amyl Acetate, containing enough Celluloid to make a thick syrup. This is then diluted as required. For a dead black a little of the syrup is diluted with Acetone or Methylated Spirit, and the Lampblack stirred in. The product should be tested on an odd piece of wood or metal to see if it dries dead black. If it does not, more black must be added, and more Acetone or spirit if the liquid is too thick. Two, or even three, coats may be necessary, and the final result should be a perfectly smooth dead-black surface.

PART IV

PHARMACEUTICAL FORMULARY

ANÆMIA CAPSULES

1. Hæmoglobin . . . 3 gr.
   Ferrous Sulphate . . 1 ,,
   Soft Paraffin . . . a sufficiency
   For one capsule.

2. Hæmoglobin . . . 3 gr.
   Iron Arsenate . . . $\frac{1}{32}$,,
   Soft Paraffin . . . a sufficiency

For one capsule. To be taken immediately after food.

3. Blaud's Pill Mass (made with Soft Paraffin) . . 5 gr.
   For one capsule.

4. Reduced Iron . . . 2 gr.
   Extract of Nux Vomica . $\frac{1}{6}$,,
   Sodium Arsenate . . $\frac{1}{32}$,,
   Extract of Aloes . . $\frac{1}{4}$,,

For one capsule. To be taken immediately after food.

5. Iron Glycerophosphate . 2 gr.
   Hæmoglobin . . . 3 ,,
   Phosphorated Suet (1 per cent.) . . . . 3 ,,
   For one capsule.

ASTHMA PREPARATIONS

Powders

1. Lobelia . . . . 2 oz.
   Stramonium . . . 2 ,,
   Black Tea . . . 2 ,,
   Mix and add to the following—
   Potassium Nitrate . . $1\frac{1}{2}$ oz.
   Boiling Water . . . a sufficiency to dissolve
   Mix and dry thoroughly. Add —
   Oil of Aniseed . . . 5 drops

2.	Lobelia	2 oz.
	Stramonium	2 ,,
	Black Tea	2 ,,
	Fennel Seed	½ ,,
	Aniseed	½ ,,
	Potassium Nitrate	1½ ,,
	Water	a sufficiency
3.	Lobelia	2 oz.
	Stramonium	2 ,,
	Indian Hemp	½ ,,
	Black Tea	1 ,,
	Oil of Eucalyptus	1 fl. dr.
	Potassium Nitrate	1½ oz.
	Water	a sufficiency

Mixture

	Ammonium Iodide	10 gr.
	Ammonium Bromide	20 ,,
	Syrup of Tolu	30 min.
	Tincture of Lobelia	20 ,,
	Water	to 1 fl. oz.

Spray

	Cocaine Hydrochloride	10 gr.
	Conium Juice	2 fl. dr.
	Glycerin	1 ,,
	Rectified Spirit	2 ,,
D.D.A.	Gaultheria Water to	2 fl. oz.

Cigarettes

Stramonium	1 oz.
Potassium Nitrate	30 gr.
Distilled Water	4 fl. dr.

Dissolve the salt in the water and pour on the Stramonium. Mix, dry, and roll into cigarettes.

MEDICATED BATH POWDERS

1. Simple Basis

Coarse Oatmeal	½ oz.
Powdered Borax	1 dr.
Powdered Soap	1 ,,

Mix and stitch in a muslin bag.

2. Birch Tar

Oil of Birch Tar (Ol. Rusci)	3 fl. dr.
Simple Basis No. 1	for one bag

Put each in parchment envelope.

3. **Sulphur, Camphor, and Balsam of Peru**

Sulphur	1 dr.
Camphor	30 gr.
Balsam of Peru	10 min.
Simple Basis No. 1	for one bag

Put each in parchment envelope.

4. **Sulphur, Camphor, and Carbolic**

Sulphur	1 dr.
Camphor	30 gr.
Carbolic Acid	30 ,,
Simple Basis No. 1	for one bag

Put each in parchment envelope.

5. **Resorcin**

Resorcin	60 gr.
Simple Basis No. 1	for one bag

6. **Resorcin and Ichthamol**

Resorcin	60 gr.
Ichthamol	60 ,,
Simple Basis No. 1	for one bag

Put each in parchment envelope.

7. **Extract of Pine**

Extract of Pinus Sylvestris	90 gr.
Simple Basis No. 1	for one bag

8. **Creolin**

Creolin	90 min.
Simple Basis No. 1	for one bag

9. **Thymol and Wintergreen**

Thymol	2 gr.
Methyl Salicylate	60 min.
Simple Basis No. 1	for one bag

10. **Juniper**

Juniper Tar Oil (Ol. Cadinum)	3 fl. dr.
Simple Basis No. 1	for one bag

11. **Beta Naphthol**

Beta Naphthol	60 gr.
Simple Basis No. 1	for one bag

CHILBLAIN APPLICATIONS

Pastes

1. Camphor . . . . 1 dr.
   Hard Paraffin . . . 1 ,,
   Capsicum Ointment . . 1 oz.

To be well rubbed in night and morning. *Not to be used for broken chilblains.*

2. Potassium Iodide . . 15 gr.
   Strong Solution of Ammonia. 15 min.

Dissolve and add to—

Capsicum Ointment . . 1 oz.

Rub in gently. *Not to be used for broken chilblains.*

Liniments.

1. Soap Liniment . . . 3 fl. oz.
   Compound Mustard Liniment 1 ,,

Rub in gently. *Not to be used for broken chilblains.*

2. Camphor Liniment . . 2 dr.
   Oil of Turpentine . . 1 fl. oz.
   Chloroform Belladonna . ½ ,,
   Chloroform Aconite . . ½ ,,

Rub in briskly. *Not to be used for broken chilblains.*

3. Oil of Eucalyptus,
   Methyl Salicylate,
   Oil of Clove,
   Camphorated Oil . of each equal parts

Rub in briskly. *Not to be applied to broken chilblains.*

4. Expressed Oil of Mustard,
   Oil of Thyme . of each equal parts

Rub in gently. *Not to be used for broken chilblains.*

Paints

1. Atropine . . . . 1 gr.
   Oil of Thyme . . . 1 fl. dr.
   Solution of Gutta-Percha in
   Chloroform to . . . 1 fl. oz.

Paint over the inflamed area. *Not to be applied to broken chilblains.*

2. Essential Oil of Mustard . 2 drops
Camphor . . . . 10 gr.
Oil of Origanum . . . 1 fl. dr.
Tincture of Iodine . . 1 ,,
Flexible Collodion to . . 1 fl. oz.

Paint over the inflamed area. *Not to be used for broken chilblains.*

3. Solution of Zinc Sulphate 25 per cent.

Tint with Carmine, and add a trace of Otto of Rose. *Not to be used for broken chilblains.*

Chilblain Ball

Camphor . . . . 2 dr.
Iodine . . . . 1 ,,
Potassium Iodide . . 20 gr.
Beeswax . . . . 2½ oz.
Oil of Rosemary . . . ¼ ,,
Olive Oil . . . . 5 ,,

Applications for Broken Chilblains

1. Zinc Ointment,
Boric Ointment . of each equal parts
2. Iodoform Ointment . . 2 dr.
Boric Ointment . . 6 ,,
3. Red Oxide of Mercury . . 1 gr.
Carbolic Acid Ointment . 2 dr.
Zinc Ointment . . . 6 ,,

Chilblain Preventive

Resin . . . 100 gr.
Gutta-Percha Tissue . . 1½ oz.
Chloroform . . . 1 pint

Dissolve and paint on the itching chilblain twice a day. If used on the first symptom of itching, further development is checked.

CHILDREN'S POWDERS

Aperient, Cooling, Fever, or Teething Powder

1. Calomel . . . . 1 part
Milk Sugar . . . 4 parts
2 to 6 gr. powders.
2. Calomel . . . . 1 part
Magnesium Carbonate . 1 ,,
Milk Sugar . . . 2 parts
2 to 6 gr. powders
These may be tinted pink if desired.

Brown Powder

1. Ipecacuanha Root, powder . 1 part
   Sodium Bicarbonate . . 3 parts
   Mercury with Chalk . . 12 ,,
   Rhubarb Root, powder . 18 ,,

   2 to 6 gr. powders.

2. Calomel . . . . 1 part
   Milk Sugar . . . 2 parts
   Liquorice Root, powder . 3 ,,

   2 to 6 gr. powders.

Grey Powder

1. Mercury with Chalk . . 1 part
   Milk Sugar . . . 3 parts

   2 to 6 gr. powders.

2. Mercury with Chalk . . 1 part
   Sodium Bicarbonate . . 1 ,,
   Milk Sugar . . . 2 parts

   2 to 6 gr. powders.

Thrush and Canker Powder

Borax . . . . 1 part
Icing Sugar . . . 1 ,,

A small quantity to be dabbed on the spots night and morning.

NOTE.—Antimony compounds should not be given to children.

WORM MEDICINES FOR CHILDREN

Cakes

1. Santonin . . . .120 gr.
   Calomel . . . . 60 ,,
   Gingerbread Dough . 1½ lb.

Mix very thoroughly and divide into 120 cakes. Bake at lowest possible temperature. **Dose:** One or two, according to age.

Gingerbread Dough

Flour . . . . 14 oz.
Brown Sugar . . . 1 lb.
Butter . . . . ½ ,,
Ground Ginger . . . 1 oz.

Warm the butter. Mix the flour and ginger and add the butter and sugar.

2. Santonin . . . 120 gr.
Compound Scammony Powder . . . 1 oz.
Gingerbread Dough . . 24 oz.

Mix and divide into 100 cakes. Bake. **Dose**: One or two, according to age.

3. Santonin . . . 120 gr.
Calomel . . . 90 ,,
Powdered Sugar . 500 ,,
Chocolate . . . 250 ,,
Essence of Vanilla . . 15 drops
Syrup . . . . to form a mass

Divide into 100 cakes. Allow to dry. One for a dose; half a cake for a young child.

4. Santonin . . . 500 gr.
Calomel . . . 350 ,,
Powdered Sugar . . 1 lb.
Powdered Acacia . 300 gr.
Mucilage of Acacia . . 1 fl. oz.
Tincture of Orange . . ½ ,,
Distilled Water . . . sufficient to make a mass

Divide into 500 lozenges. Dry at ordinary temperature for several days. One for a dose.

5. Jalapin . . . . ½ oz.
Calomel . . . . 1½ ,,
Chocolate . . . . ½ lb.
Sugar, ground . . . 3½ ,,
Mucilage of Acacia . a sufficiency

Mass and divide into 350 cakes.

Powders

5. Jalapin . . . . 10 gr.
Santonin . . . . 20 ,,
Calomel . . . . 10 ,,
Oil of Aniseed . . . 2 drops
Ginger . . . . 5 gr.
Sugar . . . . 10 ,,

Dose: 2 to 3 gr.

6. Jalapin . . . 200 gr.
Sugar . . . 120 ,,
Santonin . . . 240 ,,
Scammony Resin . 100 ,,
Saccharin . . . . 2 ,,

Dose: 2 to 4 gr.

Syrups

1. Santonin . . . . 2 gr.
   Chloroform . . . 5 min.
   Syrup of Figs . . to 1 oz.

2. Santonin . . . . 4 gr.
   Compound Powder of Tragacanth . . . . 2 ,,
   Liquid Extract of Indian Pink 30 min.
   Syrup of Senna . . to 1 oz.

COMPOSITION POWDER

1. Powdered Bayberry Bark . 1 lb.
   Powdered Black Pepper . ½ oz.
   Powdered Cinnamon . . 1 ,,
   Powdered Clove . . . 1 ,,
   Powdered Ginger . . 1 ,,

2. Powdered Bayberry Bark . 1 lb.
   Powdered Hemlock Spruce Bark . . . . 3 oz.
   Powdered Ginger . . 1 ,,
   Powdered Coriander . . 1 ,,
   Powdered Capsicum . . ½ ,,
   Powdered Clove . . . 1 ,,

3. Powdered Bayberry Bark . 1 lb.
   Powdered Cassia. . . 2 oz.
   Powdered Ginger . . 2 ,,
   Powdered Clove . . . 1 ,,
   Powdered Black Pepper . 1 ,,

COMPOSITION ESSENCE

Composition Powder . . 1 lb.
Rectified Spirit . . . 8 fl. oz.
Glycerin . . . . 4 ,,
Water . . . to 2 pints

Mix the Spirit, Glycerin, and one pint of water, and extract the powder with this menstruum by percolation. Press. Boil the residue with 2 pints of water for ten minutes, strain and evaporate to ½ pint. Cool, mix with percolate, filter if necessary, and add water to make two pints.

COMPRESSED TABLETS

Antacid

Magnesium Carbonate, Heavy 5 oz.
Precipitated Chalk . . 7 ,,
Sodium Chloride . . 2 ,,
Simple Syrup . . . a sufficiency

Mix to a slightly damp powder, pass through a 20-hole sieve, dry, and compress into 15 gr. tablets.

Antibilious

Calomel	½ oz.
Compound Extract of Colocynth	2½ ,,
Ipecacuanha Root, powder	30 gr.
Oleo-Resin of Ginger	1 dr.
Milk Sugar	1 oz.
Simple Syrup	a sufficiency

Proceed as for Antacid tablets. Make 4 gr. tablets.

Anti-Constipation

Compound Extract of Colocynth	1 oz.
Extract of Henbane	¼ ,,
Jalap Root, powder	1 ,,
Leptandrin	½ ,,
Podophyllin	¼ ,,
Powdered Extract of Taraxacum	¼ ,,
Oil of Peppermint	15 min.
Simple Syrup	a sufficiency

Make 3 gr. tablets.

Bismuthated Magnesia

Bismuth Carbonate	1 oz.
Sodium Bicarbonate	5 ,,
Magnesium Carbonate, Heavy	6 ,,
Simple Syrup	a sufficiency

Proceed as for Antacid tablets. Make 15 gr. tablets.

Bismuthated Magnesia with Mint

To the above formula add to each 1 lb. of granules, when ready for compressing—

Oil of Peppermint	30 min.

Cold Cure

1.

Acetanilide	5 oz.
Camphor	2½ ,,
Podophyllum Resin	1 dr.
Quinine Sulphate	2½ oz.
Simple Syrup	a sufficiency

Make 3 gr. tablets.

2.

Acetanilide	1 oz.
Ammonium Carbonate	2 ,,
Camphor	1 ,,
Podophyllum Resin	1 dr.
Quinine Sulphate	2 oz.
Simple Syrup	a sufficiency

Make 3 gr. tablets.

Chilblain

Calcium Iodide	1 oz.
Calcium Lactate	9 ,,
Simple Syrup	a sufficiency

Make 5 gr. tablets.

Diarrhœa

1.	Lead Acetate	2 oz.
	Opium, powder	1 ,,
	Gum Acacia, powder	½ ,,
	Strong Tincture of Capsicum	½ ,,
	Oil of Caraway	1 fl. dr.
	Milk Sugar	4 oz.
D.D.A.	Simple Syrup	a sufficiency

Make 4 gr. tablets.

2.	Aromatic Chalk Powder	10 oz.
	Bismuth Subnitrate	15 ,,
	Pepsin	1 ,,
	Milk Sugar	9 ,,
	Simple Syrup	a sufficiency

Make 5 gr. tablets.

Formamint

Citric Acid, power	2 oz.
Milk Sugar, powder	2 lb.
Sugar, powder	3 ,,
Gum Acacia, powder	4 oz.
Oil of Peppermint	½ fl. oz.
Solution of Formaldehyde	3 ,,
Simple Syrup	a sufficiency

Mix all the ingredients, excepting the Oil of Peppermint, to a damp powder. Proceed as for Antacid tablets, adding the oil when ready for compressing. Make 15 gr. tablets.

Formalin Cinnamon

Citric Acid, powder	2 oz.
Milk Sugar, powder	2 lb.
Sugar, powder	3 ,,
Gum Acacia, powder	4 oz.
Oil of Cinnamon	2 fl. dr.
Solution of Formaldehyde	3 fl. oz.
Syrup	a sufficiency

Proceed as for Formamint tablets, but if a Cinnamon-tinted tablet is required the syrup should first be tinted by using Raspberry Red 45612 and Caramel B.

Gout and Rheumatism

1. Capsicum, powder . . 1 oz.
   Quinine Salicylate . . 5 ,,
   Extract of Colchicum, powder 2 ,,
   Simple Syrup . . . a sufficiency

   Make 4 gr. tablets.

2. Mercury with Chalk . . 10 oz.
   Extract of Belladonna . . 1 ,,
   Extract of Colchicum, powder 3 ,,
   Compound Extract of Colocynth . . . . 12 ,,
   Simple Syrup . . . a sufficiency

   Make 4 gr. tablets.

3. Lithium Guaiacate . . 1 oz.
   Lithium Salicylate . . 4 ,,
   Simple Syrup . . . a sufficiency

   Make 5 gr. tablets.

Headache and Neuralgia

1. Caffeine Citrate . . . 1 oz.
   Phenacetin . . . 4 ,,
   Simple Syrup . . . a sufficiency

   Make 5 gr. tablets.

2. Caffeine . . . . 4 oz.
   Phenacetin . . . 18 ,,
   Quinine Hydrobromide . 3 ,,
   Simple Syrup . . . a sufficiency

   Make 5 gr. tablets.

3. Caffeine . . . . 1 oz.
   Phenacetin . . . 2 ,,
   Phenazone . . . 2 ,,
   Simple Syrup . . . a sufficiency

   Make 5 gr. tablets.

Indigestion

1. Diastase . . . . 1 oz.
   Ipecacuanha Root, powder . ¼ ,,
   Pepsin . . . . 12 ,,
   Extract of Nux Vomica . ¼ ,,
   Simple Syrup . . . a sufficiency

   Make 3 gr. tablets.

2. Ginger Root, powder . . 2 oz.
Ipecacuanha Root, powder . ¼ ,,
Sodium Bicarbonate . . 8 ,,
Extract of Nux Vomica . ¼ ,,
Extract of Rhubarb . . 1 ,,
Extract of Gentian . . 2 ,,
Simple Syrup . . . a sufficiency
Make 3 gr. tablets.

3. Calcium Lactophosphate . 1 oz.
Diastase . . . . 1 ,,
Pancreatin . . . 1 ,,
Pepsin . . . . 1 ,,
Milk Sugar. . . . 1 ,,
Simple Syrup . . . a sufficiency
Make 5 gr. tablets.

4. Bismuth Carbonate . . 2 oz.
Pepsin . . . . 1 ,,
Sodium Bicarbonate . . 2 ,,
Ginger powder . . . ¼ ,,
Simple Syrup . . . a sufficiency
Make 5 gr. tablets.

Sea-Sickness

1. Ammonium Bromide . . 6 oz.
Cocaine Hydrochloride . ¼ ,,
D.D.A. Simple Syrup . . . a sufficiency
Make 3 gr. tablets.

2. Chlor-butol.
Make 5 gr. tablets.

Voice and Throat

1. Borax . . . . 1 oz.
Potassium Chlorate . 4 ,,
Simple Syrup . . . a sufficiency
Make 5 gr. tablets.

2. Borax . . . . 1 oz.
Cocaine Hydrochloride . 1 gr.
Potassium Chlorate . . 2 oz.
Make 5 gr. tablets.

3. Citric Acid, powder . . 2 oz.
Milk Sugar, powder . . 2 lb.
Sugar, powder . . . 3 ,,
Gum Acacia, powder . . 4 oz.
Carbolic Acid . . . ½ ,,
Menthol . . . . ½ ,,
Tincture of Iodine . . 4 fl. oz.
Solution of Formaldehyde . 3 ,,
Simple Syrup , , a sufficiency

Proceed as for Formamint tablets, adding the solution of Carbolic Acid and Menthol in the Tincture of Iodine when ready for compressing. Dry again in warm place. Make 15 gr. tablets.

Eye Lotion

1. Boric Acid . . . 10 oz.
D.D.A. Cocaine Hydrochloride . 20 gr.
Make 5 gr. tablets.

2. Boric Acid.
Make 5 gr. tablets.

3. Zinc Sulphate.
Make 5 gr. tablets.

4. Boric Acid . . . 3 oz.
Zinc Sulphate . . . 2 ,,
Make 5 gr. tablets.

CORN AND WART APPLICATIONS

1. Corn Solvent

Salicylic Acid . . . 6 dr.
Spirit of Ether . . . 6 fl. dr.
Extract of Indian Hemp . 1 dr.
Flexible Collodion to produce 6 fl. oz.

2. Corn and Bunion Plaster

Salicylic Acid . . . 1 oz.
Belladonna Plaster . . 1 ,,
Lead Plaster . . . 2 ,,

3. Corn Cure

Salicylic Acid . . 6 dr.
Glacial Acetic Acid . . 2 fl. dr.
Extract of Indian Hemp . 1 dr.
Cocaine . . . . 2 gr.
Flexible Collodion to produce 6 fl. oz.

4. Salicylic Acid . . . 6 dr.
Iodine . . . . 15 gr.
Extract of Indian Hemp . 1 dr.
Extract of Belladonna (made by evaporating the liniment) . . . . ½ dr.
Flexible Collodion to produce 6 fl. oz.

5. Salicylic Acid . . . 6 dr.
Zinc Chloride . . . ½ „
Extract of Indian Hemp . 1 „
Flexible Collodion to produce 1 fl. oz.

For Soft Corns

Salicylic Acid . . . 1 dr.
Boric Acid . . . 1 „
Methyl Salicylate . . 10 min.
French Chalk to . . 4 oz.

Dust between the toes freely.

MEDICATED COTTONS AND LINTS

As a general rule it does not pay to make medicated dressings, but it may happen that something new is prescribed and has to be made extemporaneously. The following formulas and directions may be taken as a basis on which to work.

1. **Cotton or Lint with Salicylic Acid** 5 %

Salicylic Acid . . . 1 oz.
Glycerin . . . 2 fl. oz.
Industrial Spirit . . 15 „
Absorbent Cotton . . 1 lb.

Dissolve the Salicylic Acid and Glycerin in the Spirit, and pour the mixture on to the cotton in such a way that it is fairly evenly distributed. Roll up the cotton into a ball, and wrap in clean calico. Introduce into a powerful hydraulic or screw press and squeeze until the liquid just begins to ooze out. Relieve the pressure, unwrap the cotton and fold up in a different way from the first, and again press. Take out and spread on a line, in an atmosphere free from dust, for the spirit to evaporate.

2. **Cotton or Lint with Carbolic Acid** 5 %

Carbolic Acid . . . 1 fl. oz.
Glycerin . . . 2 „
Industrial Spirit . . 15 „
Absorbent Cotton . . 1 lb.

3. **Cotton or Lint with Ferric Chloride** 10 %

Ferric Chloride . . . 2 oz.
Glycerin . . . 2 fl. oz.
Distilled Water . . . 15 „
Absorbent Cotton . . 1 lb.

Proceed as above, but the cotton must be hung up to dry in a warm room.

4. Cotton or Lint with Iodine 5 %

Iodine	1 oz.
Potassium Iodide	1 ,,
Glycerin	1 fl. oz.
Industrial Spirit	15½ ,,
Absorbent Cotton	1 lb.

5. Cotton or Lint with Iodoform 5 %

Iodoform	¾ oz.
Methylated Ether, ·730	36 fl. oz.
Absorbent Cotton	1 lb.

All operations must be conducted away from lights and fires.

COUGH BALSAMS

Balsam of Aniseed

1. Oil of Anise . . . 15 min.
   Liquid Extract of Liquorice . 1½ fl. oz.
   Syrup of Tolu . . . 10 ,,
   Simple Syrup . . to 1 pint

2. Ipecacuanha Wine . . ½ fl. oz.
   Compound Tincture of Camphor . . . . 1 ,,
   Oil of Anise . . . 10 min.
   Liquid Extract of Liquorice . 1 fl. oz.
   Syrup of Virginian Prune . 5 ,,
   Syrup of Tolu . . . 5 ,,
   Simple Syrup . . to 1 pint

Balsam of Honey

Ipecacuanha Wine	½ fl. oz.
Glycerin	4 ,,
Oxymel to	1 pint

Balsam of Linseed and Honey

Chlorodyne	½ fl. oz.
Glycerin	2 ,,
Ipecacuanha Wine	½ ,,
Oxymel of Squill	4 ,,
Tincture of Capsicum	40 min.
Treacle	8 oz. (wt.)
Infusion of Linseed to	1 pint

Balsam of Horehound, Linseed and Liquorice

Oil of Anise	10 min.
Oil of Peppermint	2 ,,
Spirit of Chloroform	2 fl. dr.

Liquid Extract of Liquorice	2 fl. oz.
Compound Tincture of Camphor	1 ,,
Syrup of Virginian Prune	4 ,,
Syrup of Tolu	4 ,,
Oxymel of Squill	2 ,,
Infusion of Linseed and Horehound to	1 pint

Lung Tonic

Coltsfoot	1 dr.
Linseed	1 ,,
Horehound	1 ,,
Oil of Anise	5 min.
Chlorodyne	1 fl. oz.
Liquid Extract of Liquorice	1 ,,
Tincture of Capsicum	20 min.
Oxymel of Squill	6 fl. oz.
Treacle	8 ,,
Distilled Water to	1 pint

DENTAL PREPARATIONS

Mouth Washes

1. *Astringent*

Rhatany	½ oz.
Cardamom	30 gr.
Cinnamon	30 ,,
Cinchona	30 ,,
Salol	30 ,,
Quillaia	½ oz.
Saccharin	15 gr.
Oil of Wintergreen	30 min.
Oil of Peppermint	20 ,,
70 per cent. Alcohol to	1 pint

Macerate for fourteen days, strain, press, and filter.

2.

10 vol. Hydrogen Peroxide	1 fl. oz.
Glycerin	2 fl. dr.
Rose Water to	3 fl. oz.

For whitening the teeth and removing fetid odour due to carious teeth. To be used twice a week.

3.

Tincture of Quillaia	5 fl. oz.
Glycerin	1 ,,
Oil of Wintergreen	15 min.
Peppermint Water	10 fl. oz.
Spearmint Water to	1 pint

4. *Tincture of Myrrh, Borax, and Eau de Cologne*

Oil of Bergamot, Oil of Neroli, Oil of Orange Peel, Oil of Rosemary	of each	15 min.
Glycerin of Borax		1 fl. oz.
Myrrh		1 oz.
Rose Water		5 fl. oz.
Rectified Spirit		1 pint

Macerate for fourteen days and filter.

5. *Mint Dental Spirit*

Methyl Salicylate		2½ fl. dr.
Oil of Peppermint		5 ,,
Oil of Spearmint		50 min.
Glycerin		5 fl. oz.
Saccharin		3 gr.
Rectified Spirit	to	1 pint

6. *Carbolic Dentifrice*

Liquefied Carbolic Acid		1 fl. dr.
Tincture of Quillaia		1 fl. oz.
Essence of Peppermint		10 min.
Solution of Carmine (1 in 60)		5 ,,
Distilled Water	to	10 fl. oz.

7. *Antiseptic*

Thymol		20 gr.
Benzoic Acid		120 ,,
Eau de Cologne	to	1 pint

8. Brown Windsor Soap		1 oz.
Tincture of Rhatany		1 fl. oz.
Glycerin of Borax		4 fl. dr.
Any good Liqueur*		1 fl. oz.
Carbolic Acid		2 fl. dr.
Elixir of Saccharin		2 ,,
45 per cent. Alcohol	to	1 pint

9. *White Rose Dentifrice*

Soft Soap		4 dr.
Tincture of Quillaia		4 fl. oz.
Glycerin		1 ,,
Elixir of Saccharin		2 fl. dr.
Otto of Rose		10 min.
Oil of Lemon		5 ,,
Oil of Clove		5 ,,
45 per cent. Alcohol	to	1 pint

* The Formula for "Benedictine" in this book makes an excellent preparation, and one which is very distinctive.

10. Oil of Aniseed,
Oil of Cassia,
Oil of Cinnamon,
Oil of Caraway,
Oil of Clove . of each 1 fl. dr.
Essential Oil of Almond . 5 min.
Solution of Cochineal . . a sufficiency
70 per cent. Alcohol . to 1 pint

11. *Soap Bark Lotion*

Quillaia Bark . . . 12 oz.
Pellitory,
Orris,
Cinchona . . of each 1 oz.
Benzoic Acid,
Thymol . . of each 5 gr.
Tannic Acid . . . 1 dr.
Sugar . . . . 12 oz.
Oil of Wintergreen . . 90 min.
Oil of Peppermint . . 10 ,,
Cochineal . . . . 2 dr.
45 per cent. Alcohol . to 4 pints

Macerate for fourteen days, press, and filter.

12. *Eucalyptus Mouth Wash*

Eucalyptol . . . . 2 fl. dr.
Tincture of Eucalyptus . 2 fl. oz.
Solution of Chlorophyll . a sufficiency
Menthol . . . . 5 gr.
Tincture of Pellitory . . 2 fl. oz.
45 per cent. Alcohol . to 1 pint

13. *Pellitory Mouth Wash*

Tincture of Pellitory,
Eau de Cologne,
Lavender Water . of each 2 fl. oz.
Oil of Clove . . . 1 fl. dr.
Carbolic Acid . . . 1 ,,
45 per cent. Alcohol . to 1 pint

14. *Tannin Lotion*

Tannic Acid . . . ½ oz.
Tincture of Cinnamon,
Tincture of Cinchona,
Tincture of Myrrh of each 3 fl. oz.
Essence of Rose,
Essence of Almond,
Essence of Vanilla of each 2 fl. dr.
45 per cent. Alcohol . to 1 pint

15. Thymol . . . . 20 gr.
Menthol . . . . 20 „
Camphor . . . . 20 „
Benzoic Acid . . . 20 „
Salicylic Acid . . . 20 „
Solution of Cochineal . . a sufficiency
60 per cent. Alcohol . to 1 pint

16. Oil of Lavender,
Oil of Angelica,
Oil of Coriander,
Oil of Fennel,
Oil of Cinnamon of each 30 min.
Essential Oil of Almond . 5 „
Solution of Cochineal . . a sufficiency
60 per cent. Alcohol . to 1 pint

Perfumed Carbolic Acid

Carbolic Acid (pure) . . 1 oz.
Glycerin . . . . 1 fl. oz.
Clove Water . . . 4 „
Orange-flower Water . . 1 „
Rose Water . . to 1 pint

This gives a 5 per cent. solution (practically). Filter bright through Kieselguhr.

Directions.—One teaspoonful in a wineglassful of water for rinsing the mouth, or as a gargle.

Glycerin of Myrrh and Borax

Myrrh, in coarse powder . 1 oz.
Powdered Borax . . . 1½ „
Glycerin . . . . 3 fl. oz.
Water . . . . 3 „

Mix in a flask, and boil for ten minutes. Make up to 6 fl. oz. with water, if necessary, and filter.

Useful for the preparation of mouth washes, &c.

Compressed Tablets for the Preparation of Mouth Washes

These are exceedingly useful for travellers, and, as nearly every pharmacist now possesses a tablet machine, there is no difficulty in manufacturing.

Sodium Bicarbonate . . 8 oz.
Saccharin (soluble) . . 1 dr.
Vanillin,
Coumarin,
Benzoic Acid . of each 20 gr.

Oil of Clove,
„ Caraway,
„ Lemon,
„ Wintergreen,
„ Peppermint,
Carbolic Acid,
Oleo-Resin of Capsicum
of each 30 min.
Carmine . . . . 20 gr.

Mix, granulate, and stamp into 5-grain tablets. One to be dissolved in half a wineglassful of water and used as a mouth wash.

Tooth Blocks

For the manufacture of Tooth Blocks any of the formulas for Tooth Powders (page 239) may be employed, provided they do not contain Sodium Bicarbonate; mass with—

Distilled Water,
Glycerin,
Glucose,
Brown Windsor Soap, of each equal parts

The soap is shredded and dissolved in the water by heat, any loss by evaporation being made up. The mass must be sufficiently firm to be rolled out on a slab, the thickness being regulated by means of two lateral wooden strips. Cut into tablets with a tin punch of rectangular shape (corners rounded), and place in a warm room to dry.

Dies for stamping the name can be obtained at little cost, and a well-printed name always adds to the finish.

To prevent sticking, dust with Kaolin.

Tooth Soaps, &c.

Tooth Soaps do not contain any powders, but are made from the purest toilet soap, flavoured with essential oils, &c.

As a rule they are prepared by soap makers, but if desired inexpensive tablets may be prepared as follows—

Take 1 lb. of the freshest Castile Soap, prepared with *sweet* Olive Oil, and melt over a water bath, making up the loss by evaporation. When melted add—

Glycerin . . . . 4 fl. dr.
Oil of Clove,
„ Lemon,
„ Caraway,
„ Cassia,
„ Wintergreen,
Carbolic Acid . of each 40 min.
Saccharin . . . . 24 gr.

Stir and pour into an extemporary mould, made by arranging four pieces of wood of about 1 inch section in the form of a rectangle on a well-oiled stone slab. Allow to set for about a week, and cut into tablets, which must be wrapped in paraffined paper, boxed, and set on one side for some time to ripen.

Tooth Pastes

General Excipient for Tooth Pastes

Glycerin	1 part
Simple Syrup	1 ,,
Water	1 ,,

Areca Tooth Paste

Powdered Myrrh	4 dr.
Prepared Chalk	7 oz.
Powdered Areca	1 ,,
Oil of Clove,	
,, Cinnamon,	
,, Cassia,	
,, Caraway	of each 10 min.
Powdered Tragacanth	15 gr.

Mix intimately, and add, all at once, the following mixture—

Distilled Water	2½ fl. oz.
Tincture of Capsicum	1 fl. dr.
Glucose	4 dr.
Glycerin	2 fl. oz.
Solution of Cochineal	4 fl. dr.

Beat to a uniform mass.

Carbolic Tooth Paste

1.	Precipitated Chalk	4 oz.
	Prepared Chalk	4 ,,
	Cuttlefish Bone, powder	2 ,,
	Orris Root, powder	2 ,,
	Armenian Bole	1 ,,
	Hard Soap, powder	½ ,,
	Liquefied Carbolic Acid	2 fl. dr.
	Otto of Rose	3 drops
	Oil of Lavender	3 ,,
	General Excipient	a sufficiency
2.	Precipitated Chalk	12 oz.
	Orris Root, powder	2 ,,
	Hard Soap, powder	½ ,,
	Carmine	40 gr.
	Liquefied Carbolic Acid	1 fl. dr.
	Methyl Salicylate	15 drops
	Oil of Peppermint	20 ,,
	General Excipient	a sufficiency

Cherry Tooth Paste

Pumice Powder	1½ oz.
Powdered Orris	2 ,,
Precipitated Chalk	5 ,,
Powdered Tragacanth	15 gr.
Oil of Clove	1 fl. dr.

Mix intimately, and add, all at once, the following mixture—

Morella Cherry Juice	2½ fl. oz.
Glycerin	2 ,,
Glucose	4 dr.
Solution of Cochineal	4 fl. dr.

Beat to an even mass. This is a very superior tooth paste, always liked.

Chlorate of Potash Tooth Paste

Precipitated Chalk	6 oz.
Potassium Chlorate, powder	1 ,,
Cuttlefish Bone, powder	1 ,,
Hard Soap, powder	1 ,,
Magnesium Carbonate, Light	1 ,,
Oil of Anise	5 drops
Oil of Peppermint	30 ,,
General Excipient	a sufficiency

Thymol and Eucalyptus Tooth Paste

Precipitated Chalk	6 oz.
Magnesium Carbonate, Heavy	1 ,,
Orris Root, powder	1 ,,
Hard Soap, powder	1 ,,
Thymol	10 gr.
Oil of Eucalyptus	20 min.
Methyl Salicylate	20 ,,
General Excipient	a sufficiency
Lemon Yellow 19943	to tint

NOTE.—*Any of the following Tooth* Powder *formulas may be utilised for the preparation of* Pastes, *by massing with the General Excipient for Tooth Pastes.*

Tooth Powders

NOTE.—*Although "coral" and other pink-coloured tooth powders were popular some years ago, the public taste has changed, and colourless dentifrices are preferred. If, however, a pink tooth powder is desired, the colour may be obtained with Carmine. It should always be ground in* damp *so as to ensure even admixture.*

Thymol

1. Precipitated Chalk . . 1 oz.
   Soluble Saccharin . . 1 gr.
   Thymol . . . . 1 ,,
   Oil of Peppermint . . 3 drops

Menthol

2. Precipitated Chalk . . 1 oz.
   Powdered Castile Soap . 1 dr.
   Menthol . . . . 2 gr.
   Oil of Peppermint . . 2 drops
   Soluble Saccharin . . 1 gr.

Wintergreen

3. Precipitated Chalk . . 1 oz.
   Powdered Castile Soap . 1 dr.
   Soluble Saccharin . . 1 gr.
   Oil of Wintergreen . . 5 drops
   Powdered Cuttlefish Bone . 30 gr.

Clove

4. Precipitated Chalk . . 1 oz.
   Powdered Castile Soap . 1 dr.
   Oil of Clove . . . 4 drops
   Otto of Rose . . . ¼ drop

Salol

5. Precipitated Chalk . . 1 oz.
   Salol . . . . 5 gr.
   Powdered Castile Soap . 1 dr.
   Oil of Caraway . . . 3 drops
   Powdered Cuttlefish Bone . 30 gr.

Carbolic

6. Finely-ground Kieselguhr . 1 oz.
   Carbolic Acid . . . 10 gr.
   Soluble Saccharin . . 1 ,,
   Otto of Rose . . . ½ drop

Quinine

7. Precipitated Chalk . . 1 oz.
   Powdered Orris . . . 1 dr.
   Quinine (alkaloid) . . 1 gr.
   Oil of Spearmint . . . 1 drop

Alkaline Soap

8. Precipitated Chalk . . 1 oz.
   Powdered Myrrh . . 30 gr.
   Carbonate of Magnesia . 1 dr.
   Powdered Castile Soap . 1 ,,
   Powdered Orris . . . 1 ,,
   Oil of Clove . . . 4 drops

Alkaline Camphor

9.	Precipitated Chalk	1 oz.
	Bicarbonate of Soda	½ dr.
	Powdered Camphor	½ ,,
	Oil of Peppermint	1 drop

Camphorated Chalk

10.	Precipitated Chalk	1 oz.
	Powdered Camphor	1 dr.

Oriental

11.	Precipitated Chalk	1 oz.
	Powdered Orris	1 dr.
	Powdered Cuttlefish Bone	½ ,,
	Saccharin	1 gr.
	Oil of Sandal	½ drop
	Oil of Rose	¼ ,,
	Carmine	1 gr.

12.	Prepared Chalk	1 oz.
	Carmine	1 gr.
	Powdered Borax	30 ,,
	Powdered Myrrh	30 ,,
	Carbolic Acid	3 ,,
	Oil of Wintergreen	3 min.
	Oil of Peppermint	2 ,,

Chlorate of Potash

13.	Chlorate of Potash	4 dr.
	Precipitated Chalk	4 ,,
	Powdered Borax	30 gr.
	Benzoic Acid	5 ,,
	Saccharin	1 ,,
	Oil of Peppermint	2 drops

Chlorate and Charcoal

14.	Chlorate of Potash	4 dr.
	Precipitated Chalk	4 ,,
	Powdered Willow Charcoal	2 ,,
	Carbolic Acid	4 gr.
	Oil of Wintergreen	3 min.

Astringent Dentifrices

15. Powdered Cinchona Bark . 1 dr.
Powdered Orris . . . 1 ,,
Precipitated Chalk . . 1 oz.
Powdered Soap Bark . . 1 dr.
Oil of Cassia
Oil of Clove . of each 1 min.

16. Powdered Krameria . . 1 dr.
Powdered Cassia. . . ½ ,,
Camphorated Chalk . . 1 oz.
Saccharin . . . 1 gr.
Powdered Pellitory . . 15 ,,

White Rose Dentrifrices

17. Powdered Brown Windsor Soap . . . . 1 dr.
Precipitated Chalk . . 1 oz.
Powdered Borax . . 30 gr.
Otto of Rose . . . 1 drop
Oil of Neroli . . . 1 ,,
Vanillin . . . . ¼ gr.

Tint very pale pink with solution of Carmine, previously mixed with the Chalk (damped) and dried.

18. Prepared Chalk . 8 oz.
Powdered Orris . . . 1 ,,
Powdered Cuttlefish bone . 1 ,,
Powdered Borax. . . ½ ,,
Essence of Musk . . 2 fl. dr.
Otto of Rose . . . 10 drops
Oil of Lavender . . 4 ,,
Oil of Cinnamon . . 4 ,,

American Dentifrice

19. Powdered Castile Soap . 1 dr.
Carbonate of Magnesia, heavy 2 ,,
Precipitated Chalk . . 5 ,,
Soluble Saccharin . . 1 gr.
Oil of Peppermint . . 2 drops
Oil of Wintergreen . . 4 ,,
Menthol . . . . 1 gr.

Rub the last four ingredients together, and triturate uniformly with the Magnesia before adding the Chalk and Soap.

This is an excellent formula : it leaves the mouth fresh and antiseptic.

Peroxide Tooth Powder for Whitening the Teeth

20. Magnesium Peroxide . . 5 gr.
Precipitated Chalk . . 1 oz.
Oil of Wintergreen . . 3 drops
Oil of Peppermint . . 1 drop
Soluble Saccharin . . 1 gr.

Dental Cements

NOTE.—All dry ingredients must be in the finest possible state of division. All metallic oxides should have been quite recently ignited.

1. Zinc Oxide . . 100 parts
Silica . . . . 10 „
Borax (dry) . . . 5 „

Mix and preserve in stoppered bottles. When required for use make into a paste with syrupy solution of Zinc Chloride. Must be used quickly.

2. Zinc Oxide . . . 20 parts
Alumina . . . . 5 „
Silica . . . . 5 „
Magnesia . . . . 8 „

Mix and preserve in stoppered bottles.

The setting liquid is Phosphoric Acid, sp. gr. 1·500.

3. Zinc Oxide . . . 20 parts
Magnesia . . . . 2 „

The setting liquid is Phosphoric Acid, sp. gr. 1·500.

4. Zinc Oxide. . . . 30 parts
Powdered Glass . . 1 part
Aluminium Phosphate. . 1 „
Borax . . . . 1 „
Silica . . . . 1 „

The setting liquid is syrupy solution of Zinc Chloride.

5. Zinc Oxide . . . 7 parts
Silica . . . . 1 part

The setting liquid is Phosphoric Acid, sp. gr. 1·75.

6. Zinc Sulphate, *dried* . . 1 part
Zinc Oxide. . . . 3 parts

The setting liquid is saturated solution of Zinc Chloride.

7. *Gutta-Percha Stopping*

Dissolve Gutta-Percha in *pure* Carbon Bisulphide or Chloroform, and allow to stand until a clear syrupy liquid is obtained. To this add finely sifted Oxide of Zinc in

such a proportion that the mixture will pour comfortably. Pour into a mould and allow to set. Expose the sheet until all the solvent has evaporated.

Impression Wax

1. Strained Beeswax, tinted with Alkanet.

2. | | |
|---|---|
| Beeswax | 20 parts |
| Hard Paraffin | 8 ,, |

Tint with Alkanet.

3. | | |
|---|---|
| Dammar Resin | 10 oz. |
| Stearic Acid | 10 ,, |
| Hard Paraffin | 2 ,, |
| French Chalk | 18 ,, |

The latter may be tinted pink with Carmine or Bole.

4. | | |
|---|---|
| Stearic Acid | 5 oz. |
| Copal | 4½ ,, |
| Talc | 5 ,, |
| Carmine | 20 gr. |
| Oil of Rose Geranium | 10 min. |

Dissolve the Carmine in a few drops of Solution of Potash.

5. | | |
|---|---|
| Stearic Acid | 4 oz. |
| Dammar Resin | 6 ,, |
| French Chalk | 12 ,, |
| Carmine | 1 dr. |

Local Anæsthetics for Extraction

Many of the preparations on the market are of American manufacture. Most contain from 1 to 2 per cent. of Novocain in an antiseptic aqueous mixture.

Novocain	1½ part
Boric Acid	1 ,,
Sol. Adrenalin (1 in 1000)	3 parts
Glycerin	2 parts
Oil of Wintergreen	1 part
Dill Water	to 100 parts

Mix, and filter bright.

Dentist's Plaster

1. The value of Plaster of Paris can be greatly enhanced and the disadvantage of expansion minimised by the use of certain accelerators. These are mostly mineral salts which have the double property of hastening the set of the plaster and lessening the expansion. Common Salt and Potash Alum, which are often

used, do not control expansion sufficiently, but Potassium Sulphate and Sodium Potassium Tartrate are two agents which very markedly lessen expansion and at the same time accelerate the set of the plaster.

Plaster of Paris . . .	3 oz.
Sodium Potassium Tartrate .	40 gr.
Water	1½ oz.

The expansion in a block of this plaster, 4 inch long, 1 inch deep, and 1 inch broad, is 2·1000 inch or 0·050 per cent. In the proportion of 2½ oz. of plaster to 1½ oz. of water, the expansion is still further reduced.

2. Plaster of Paris . . .	49 parts
High-dried Sodium Chloride, in very fine powder . .	1 part

Arsenical Powders

	Arsenious Oxide . .	98 parts
D.D.A.	Morphine Hydrochloride .	2 ,,

Mix. The usual weight for each powder is $\frac{1}{12}$ grain. These cannot be weighed directly, but are measured, the general procedure being as follows: Take a sheet of aluminium about two inches square, of the thickness of stout cartridge paper. In this punch a small hole. Next weigh 2 grains of the above mixture, place it on the aluminium, which rests upon a glazed powder paper, and by means of a spatula fill up the hole. Do not press the powder down, but move it over the hole with the edge of the spatula. Repeat this performance until the 2 grains of powder has all been used up. If more than twenty-four powders result, the hole is too small; if less, then it is too large.

Arsenical Pastes

1.	Arsenious Oxide . . .	80 parts
	Cocaine	3 ,,
	Morphine	3 ,,
D.D.A.	Eugenol	14 ,,
2.	Arsenious Oxide . .	75 parts
	Morphine	5 ,,
	Phenazone . . .	5 ,,
D.D.A.	Oil of Clove . . .	15 ,,
3.	Arsenious Oxide . .	75 parts
	Cocaine	3 ,,
	Morphine	5 ,,
	Menthol	7 ,,
	Carbolic Acid Crystals .	2 ,,
D.D.A.	Eugenol	8 ,,

Carbolised Resin

Crystallised Phenol	3 oz.
Powdered Resin	4 ,,
Chloroform	2 fl. oz.

Pulp Capping

Zinc Oxide, with Creosote sufficient to form a stiff paste.

Iodoform Wax

Iodoform, precipitated	1 oz.
White Wax	1 ,,

Melt the Wax at very low temperature, and stir in the Iodoform.

Toothache Drops or Essences

1.	Mastic	15 parts
	Chloroform	15 ,,
	Absolute Alcohol	45 ,,
	Camphor	5 ,,
	Eugenol	5 ,,
	Menthol	14 ,,
D.D.A.	Cocaine	1 part

Apply to the cavity on cotton wool. When packed fairly tightly it hardens, and forms a temporary stopping. The cavity should first be mopped dry with cotton wool.

2.	Mastic	10 parts
	Chloroform	20 ,,
	Absolute Alcohol	40 ,,
	Cocaine	1 part
	Camphor	5 parts
D.D.A.	Oil of Clove	14 ,,

Directions as No. 1.

3.	Mastic	15 parts
	Benzoin	5 ,,
	Chloroform	10 ,,
	Absolute Alcohol	40 ,,
	Carbolic Acid	10 ,,
	Menthol	20 ,,
	Morphine	1 part
D.D.A.	Eugenol	9 parts

Directions as No. 1.

4. Mastic . . . . 10 parts
   Myrrh . . . . 5 ,,
   Tannic Acid . . . 5 ,,
   Opium . . . . 2 ,,
   Cocaine . . . . 1 part
   Menthol . . . . 15 parts
   Chloral Hydrate . . . 5 ,,
D.D.A. Absolute Alcohol . . 57 ,,

Directions as No. 1.

5. Carbolic Acid . . . 5 parts
   Oil of Clove . . . 15 ,,
   Tincture of Myrrh . . 80 ,,

6. Carbolic Acid . . . 5 parts
   Chloral Hydrate . . . 10 ,,
   Chloroform . . . 40 ,,
   Absolute Alcohol . . 45 ,,

7. Crystallised Carbolic Acid,
   Collodion . of each equal parts

8. Camphor,
   Menthol,
   Chloral Hydrate,
   Carbolic Acid . of each equal parts

A plug of absorbent cotton, soaked in the application, to be pressed into the cavity. A plug of cotton with a trace of Tincture of Myrrh to be placed above it.

Toothache or Neuralgia Powders

1. Acetyl-Salicylic Acid . . 5 gr.

2. Acetanilide . . . 3 gr.
   Caffeine . . . . 1 ,,

3. Phenazone . . . 5 gr.
   Acetanilide . . . 2 ,,
   Caffeine . . . . 1 ,,

4. Phenacetin . . . 5 gr.
   Caffeine . . . . 1 ,,

5. Gelsemine Hydrochloride . $\frac{1}{60}$ gr.
   Butyl Chloral Hydrate . 5 ,,
   Caffeine . . . . 1 ,,
   Quinine Sulphate . . 1 ,,

Iodine and Aconite Paint for the Gums

Tincture of Iodine . . 1 fl. oz.
,, ,, Aconite . . 2 ,,

EARACHE APPLICATIONS

Obstinate earache may often be relieved by placing a plug of cotton with a few drops of Chloroform in the bowl of a tobacco pipe, and blowing the vapour into the meatus of the ear. Other applications are—

Earache Drops

1.	Chloroform	1 fl. oz.
	Almond Oil	3 ,,
2.	Cocaine	10 gr.
	Chloroform	½ fl. oz.
D.D.A.	Almond Oil	3 ,,
3.	Cocaine	10 gr.
	Chloral Hydrate	½ oz.
	Camphor	½ ,,
	Chloroform	½ fl. oz.
D.D.A.	Almond Oil	3 ,,

Ear Drops for Deafness and Removing Wax

Ether	1 fl. oz.
Chloroform	1 ,,
Almond Oil	2 ,,

EFFERVESCING SALINE, OR HEALTH SALT

Important.—All ingredients must be in fine powder, and all must be well stoved before mixing.

Potassium Chlorate should never form one of the ingredients of a saline, as it is apt to cause explosions.

Salines are sent out either in fine powder or as very fine granules. For the latter, treat the mixed powders as directed under Granular Effervescent Preparations, only using a finer sieve.

1. Sodium Bicarbonate	17 oz.
Tartaric Acid	9 ,,
Citric Acid	5 ,,
Powdered Sugar	4 ,,
Dried Magnesium Sulphate	2 ,,

This is suitable for making fine granules.

2. Sodium Bicarbonate	17 oz.
Tartaric Acid	9 ,,
Citric Acid	5 ,,
Dried Magnesium Sulphate	7½ ,,

This is sugar-free. It contains about 25 per cent. of Epsom Salt.

3. Sodium Bicarbonate . . 16 oz.
   Tartaric Acid . . . 16 ,,
   Dried Sodium Sulphate . 10 ,,
   Cream of Tartar . . 12 ,,
   Sugar . . . . 2 lb.
   Terpeneless Oil of Lemon . 5 min.

4. Powdered Cream of Tartar . 1 lb.
   Dried Epsom Salt . . ½ ,,
   Sugar . . . . 3 ,,
   Sodium Bicarbonate . . 1 ,,
   Tartaric Acid . . . 1 ,,

5. Dried Epsom Salt . . ¾ lb.
   Common Salt . . . 2 oz.
   Sodium Bicarbonate . 2½ lb.
   Tartaric Acid . . . 2½ ,,
   Sugar . . . . 1¼ ,,

EMMENAGOGUE CAPSULES

1. Apiol . . . . 1 min.
   Extract of Ergot . . ½ gr.
   Extract of Hydrastis . . ¼ ,,
   Oil of Rue . . . 1 min.

For one capsule.

2. Potassium Permanganate 1 gr.
   Ammonium Chloride . . 3 ,,
   Soft Paraffin . . . a sufficiency

For one capsule.

3. Apiol . . . . 2 min.
   Caulophyllin . . . 1 gr.
   Aloin . . . . 1 ,,

For one capsule.

EYE LOTIONS AND DROPS

1. Zinc Sulphate . . . 4 gr.
   Solution of Cochineal . . a sufficiency
   Rose Water and Distilled Water (equal parts) to produce . . . . 1 fl. oz.

To be diluted with a little warm water.

2. Boric Acid . . . . 4 gr.
   Cocaine Hydrochloride . ¼ ,,
   Distilled Water . . . 1 fl. oz.

Tint with Cochineal or Saffron. To be diluted with a little warm water.

3. Borax . . . . 4 gr.
Cherry Laurel Water . . 1 fl. dr.
Distilled Water . . to 1 fl. oz.

Tint as above. Directions as above

Eye Drops—Home Office Formulas

Solution No. 1 (*Cocaine Eye Drops*)

Cocaine . . . . ½ oz.
Mercuric Chloride . . 14½ gr.
Absolute Alcohol . . 1 fl. oz.
Castor Oil . . to 6¼ lb.

Dissolve the Cocaine in 6 lb. of Castor Oil, using gentle heat. Add the solution of Mercuric Chloride in the Alcohol, and make up to weight with Castor Oil.

Solution No. 2

Sodium Bicarbonate . . 1 dr.
Water . . . . 4 fl. oz.

The official instructions concerning these solutions are—

In case of a Foreign Body in the Eye.—Apply the Eye Drops, Solution No. 1, to the affected eye-ball by means of a camel-hair brush. Do not try to remove any particle which cannot be brushed away. Tie up with a clean handkerchief or bandage. Go to a doctor *at once.*

In case of an Acid Burn.—Brush the effected eye-ball thoroughly with Solution No. 2. Then apply Solution No. 1. in the same way. Apply an eye pad, and tie up with clean handkerchief or bandage. Go to a doctor *at once.*

POWDERS FOR PERSPIRING FEET

1. Mercuric Chloride . . 3½ gr.
Water . . . . 2 fl. oz.

Dissolve and add to—

French Chalk . . . 8 oz.

Mix and dry. Add—

Maize Starch . . . 8 oz.
Methyl Salicylate . . 16 drops

Mix, and sift.

This is an excellent formula. It contains 1 in 2,000 of Mercuric Chloride. Dusted between the toes and on the inside of the socks, it mitigates excessive perspiration, while it absolutely prevents the development of the

fetid odour which is such a terrible inconvenience to many people.

It may also be used for dusting the armpits, &c.

2. β-Naphthol . . . 4 dr.
   Boric Acid . . . 1 lb.
   Maize Starch . . . 3 ,,
   Oil of Eucalyptus . . 10 min.
   Oil of Clove . . . 2 ,,

3. Salicylic Acid . . . 4 dr.
   French Chalk,
   Kaolin,
   Maize Starch . of each 6 oz.
   Methyl Salicylate . . 10 min.

4. Zinc Oleate . . . 1 oz.
   Boric Acid . . . 1 ,,
   Zinc Oxide. . . . 1 ,,
   Maize Starch . . . 8 ,,
   Kaolin . . . . 5 ,,
   Oil of Birch Tar . . . 30 drops

5. Potassium Permanganate . 1 dr.
   Kaolin . . . . 8 oz.
   French Chalk . . . 4 ,,

Dissolve the Potassium Permanganate in a little water, and mix with the powders. Dry.

6. Cresylic acid . . . 1 part
   Kaolin . . . . 49 parts
   Starch . . . . 50 ,,

7. Zinc Oleate Powder,
   Lead Oleate Powder,
   Kaolin . . of each 2 oz.
   Thymol . . . . 1 gr.

An excellent remedy for perspiring feet.

GARGLES

1. Alum . . . . 1 dr.
   Potassium Chlorate . . 1 ,,
   Rose Water and Distilled
   Water to produce . . 8 fl. oz.

2. Borax . . . . 2 dr.
   Potassium Chlorate . . 1½ ,,
   Glycerin . . . . ½ fl. oz.
   Carbolic Acid . . . 10 gr.
   Distilled Water . . to 8 fl. oz.

3. Glycerin of Tannic Acid . 4 fl. dr.
   Potassium Chlorate . . 1 dr.
   Solution of Cochineal . . a sufficiency
   Clove Water . . . 4 fl. oz.
   Distilled Water to produce . 8 ,,

4. Boric Acid . . . 1 dr.
   Potassium Chlorate . . 1 ,,
   Glycerin . . . ½ fl. oz.
   Acid Infusion of Roses (half strength) . . to 8 ,,

Chlorine

5. Potassium Chlorate . . 10 gr.
   Hydrochloric Acid . . 1 fl. dr.
   Distilled Water . . to 1 pint

Place the powdered Chlorate in a dry bottle, add the Acid, and cork securely. Shake occasionally during fifteen minutes. Add the water.

GRANULAR EFFERVESCENT PREPARATIONS

General Directions.—Mix the *dry* powders thoroughly, place on tin lined or enamelled tray, heated to about 212° F., and when the particles commence to aggregate move about, turning over occasionally, by means of a broad spatula, until a somewhat granular form is assumed. Remove from the source of heat, break up any masses, and pass through a sieve of suitable mesh.

Dry the granules, and preserve in well-stoppered bottles.

Granular Effervescent Salicylic Acid (5 gr. in 1 dr.)

Salicylic Acid (physiologically pure) . . . 600 gr.
Sodium Bicarbonate . . 8½ oz.
Tartaric Acid . . . 4 ,,
Citric Acid . . . 3 ,,

Granular Effervescent Bismuth Citrate and Pepsin

(Ammonio-Citrate Bismuth 5 gr., Pepsin 2 gr. in 1 dr.)

Ammonio-Citrate Bismuth . 1¼ oz.
Pepsin (powdered scales) . ½ ,,
Sodium Bicarbonate . . 8½ ,,
Tartaric Acid . . . 4 ,,
Citric Acid . . . 3 ,,

Granular Effervescent Bismuth, Iron and Pepsin

(Ammonio-Citrate Bismuth 5 gr., Ammonio-Citrate Iron 5 gr., Pepsin 2 gr. in 1 dr.)

Bismuth Ammonio-Citrate	2½ oz.
Ammonio-Citrate Iron	2½ ,,
Pepsin (powdered scales)	1 ,,
Sodium Bicarbonate	16 ,,
Tartaric Acid	9¼ ,,
Citric Acid	4 ,,

Granular Effervescent Carlsbad Salt (Artificial)

Dried Sodium Sulphate	1½ oz.
Sodium Bicarbonate	17 ,,
Tartaric Acid	8 ,,
Citric Acid	6 ,,

Granular Effervescent Citrate of Iron and Strychnine

(3 gr. in 1 dr.)

Citrate of Iron and Strychnine (powdered scales)	1½ oz.
Sodium Bicarbonate	17½ ,,
Tartaric Acid	8½ ,,
Citric Acid	6 ,,

Granular Effervescent Ferruginous Saline

Ferrous Sulphate	30 gr.
Magnesium Sulphate (dried)	3 oz.
Bicarbonate of Soda	8½ ,,
Tartaric Acid	3¾ ,,
Citric Acid	3¼ ,,

GAZOGENE CHARGES.

—	2 pint	3 pint	5 pint	8 pint
	grains	grains	grains	grains
Tartaric Acid (small crystals)	280	320	520	840
Sodium Bicarbonate	340	440	640	1080
Lithia Powders for Gazogenes :				
Lithium Citrate	30	50	80	
Potash Powders for Gazogenes :				
Dried Potassium Bicarbonate	15	25	40	
Seltzer Powders for Gazogenes :				
Dried Sodium Chloride	12	20	32	
Dried Magnesium Carbonate	6	10	24	
Dried Calcium Carbonate	6	10	24	
Dried Sodium Bicarbonate	9	15	24	

NOTE.—Seltzer powders may be sent out in paraffined paper if the ends of the packets are also sealed with melted paraffin, otherwise they should be put up in glass tubes.

HEADACHE, OR NEURALGIA POWDERS *

1.	Caffeine Citrate	1 gr.
	Phenacetin	9 ,,
2.	Acetanilide	2 to 4 gr.
	Caffeine Citrate	2 gr.
3.	Acetanilide	1 gr.
	Phenacetin	5 ,,
	Caffeine	1 ,,
4.	Phenazone	3 gr.
	Phenacetin	5 ,,
	Caffeine	1 ,,

* Of the above remedies, Phenacetin depresses the heart the least, Acetanilide the most. Caffeine, being a cardiac stimulant, should always be combined with any so-called antipyretic of this class.

HIERA PICRA

Many of the older formulas for this remedy were inclined to produce griping owing to insufficient carminatives.

1.	Barbadoes Aloes	12 oz.
	Powdered Canella	3 ,,
	Powdered Ginger	1 ,,
2.	Barbadoes Aloes	1 lb.
	Powdered Canella	4 oz.
	Powdered Cinnamon	1 ,,
	Powdered Ginger	1 ,,

ANTI-INFLUENZA INHALANTS

1.	Menthol	½ dr.
	Camphor	1 dr.
	Terebene	2 fl. dr.
	Oil of Eucalyptus	to 1 oz.
2.	Menthol	1 dr.
	Oil of Thyme	1 fl. dr.
	Oil of Cajuput	1 ,,
	Methyl Salicylate	1 ,,
	Oil of Eucalyptus	to 1 oz.

INSECT BITE APPLICATIONS

Preventives

1. Eucalyptol . . . 1 fl. oz.
   Oil of Cedar . . . ½ ,,
   Glycerin . . . . 1 fl. dr.
   Tincture of 'Insect Powder' (1 in 5) . . . . 5 fl. oz.

Camphor Water added by degrees until the faint opalescence is permanent.

2. Oil of Cedar . . . 4 fl. dr.
   Kerosene . . . . 2 ,,
   Camphor . . . . 1 dr.
   Oil of Birch Tar . . . 1 drop
   Methylated Spirit . . 4 fl. oz.

Mix, and add—

   Concentrated Infusion of Quassia . . . 2 fl. oz.

It should be dabbed on face, neck, wrists, and ankles.

3. Oil of Eucalyptus . . 1 fl. oz.
   Oil of Wormwood . . 2 fl. dr.
   Oil of Cedar . . . 2 ,,
   Camphorated Oil B.P. . to 4 fl. oz.

A preparation similar to this has a great vogue in the Far East as *Mosquito Oil.*

4. Quinine Hydrochloride . 1 dr.
   Spirit of Chloroform . . 4 fl. oz.
   Water . . . . 1½ ,,

5. An excellent preventive is a 20 per cent. solution of Epsom Salt in water, to which is added 1 per cent. of Glycerin. As the water evaporates a film of the salt is left on the skin, and this is most repellent to mosquitos, gnats, midges, harvest bugs, &c.

6. A mosquito lotion used in the East, under the name 'Bamber Oil,' is stated to have the following composition:

   Carbolic Acid . . . 4 gr.
   Paraffin . . . . 2 fl. dr.
   Oil of Citronella . . . 2 ,,
   Coconut Oil . . to 1 oz.

Sting Relievers

1. Camphor . . . . 1 dr.
   Carbolic Acid . . . 5 gr.
   Menthol . . . . 1 dr.
   Almond Oil . . to 2 fl. oz.

To be smeared over the bites.

2. Calamine . . . . 1 oz.
   Zinc Oxide . . . . 2 ,,
   Boric Acid . . . . ¼ ,,
   Cherry Laurel Water . . 2 ,,
   Solution of Witch Hazel . 5 ,,
   Rose Water . . to 1 pint

3. Strong Solution of Lead Subacetate . . . . 2 fl. dr.
   Strong Solution of Ammonia 2 ,,
   Camphor . . . . 15 gr.
   Glycerin . . . 1½ fl. oz.
   Rose Water . . to 1 pint

LINIMENTS

1. Turpentine Liniment, B.P.

2. Oil of Turpentine . . 16 fl. oz.
   Olive Oil . . . . 1 ,,
   Camphor . . . . ½ oz.
   Oil of Thyme . . . 2 fl. oz.
   Acetic Acid . . . 5 ,,
   Eight Eggs (yolk and white).

Dissolve the Camphor in the oils and add slowly, with constant trituration, to the well-beaten eggs. When incorporated, add very slowly, triturating meanwhile, the Acetic Acid.

3. Camphor . . . . ½ oz.
   Menthol . . . . ½ ,,
   Oil of Camphor . . . 2 fl. oz.
   Olive Oil . . . . 1 ,,
   Oil of Turpentine . . 16 ,,
   Eight Eggs (yolk and albumen).

Method as above.

Cheap White Liniment

4. Oil of Turpentine . . 1 pint
   Rape Oil . . . . 2 pints
   Solution of Ammonia . . 1 pint

Rheumatism Liniment

5. Menthol . . . . ½ oz.
   Camphor . . . . ½ ,,
   Methyl Salicylate . . 2 fl. oz.
   Oil of Turpentine . . 5 ,,
   Oil of Thyme . . . 2 ,,
   Expressed Oil of Mustard to 1 pint

Solid Opodeldoc

6. Powdered Castile Soap	2½ oz.
Camphor	¾ ,,
90 per cent. Alcohol	30 fl. oz.
Oil of Thyme	45 min.
Oil of Rosemary	90 ,,
Solution of Ammonia, ·901	1¾ fl. oz.

Dissolve the Soap and Camphor in the Alcohol by means of heat, taking care that no Alcohol is lost. Filter while hot; warm again if necessary, add the volatile oils and Solution of Ammonia. Mix; allow bubbles to escape. Pour into *warm, dry* bottles. Cork while hot.

LOZENGES

Only sufficient formulas can be given here to convey the general method on which lozenges are prepared.

Fruit Basis for Lozenges

Black Currants	7 parts
Red Currants	1 part

Mash in a stone mortar, transfer to enamelled or tinned vessel, and heat to about 212° F. for five minutes. Pulp through a fine hair sieve. Boil the seeds, &c., with a little water and pulp again.

Mix the pulp, and evaporate on water bath to a thin syrup; allow to cool. Add to each part of cold pulp 1½ parts of *coarse* granulated sugar. Stir well, but do not warm.

Live-Long Candy

Powdered Rhubarb,		
Powdered Caraway,		
Powdered Cardamom,		
Powdered Ginger	of each	4 oz.
Powdered Cinnamon		1 dr.
Powdered Sugar		6 lb.
Powdered Tragacanth		¾ oz.
Powdered Acacia		½ ,,
Distilled Water		13 fl. oz.

Beat to mass. Roll out into a cake, using wooden runners on each side of the roller to ensure the thickness being uniform. With a sharp knife divide into rectangular shaped lozenges. Allow to dry at air temperature for fourteen days.

Antacid Lozenges (Sir Wm. Roberts' Formula)

Salt	540 gr.
Carbonate of Magnesia	3 oz. troy
Prepared Chalk	4½ ,, ,,
Sugar	21¾ ,, ,,
Mucilage of Acacia	12 fl. dr.
Powdered Tragacanth	6 dr.
Rose Water	10 fl. dr.

Mass and cut 20 grain lozenges. Dry.

Bismuth and Ginger Lozenges

Bismuth Carbonate	24 oz.
Magnesium Carbonate (heavy)	12 ,,
Bicarbonate of Soda	20 ,,
Powdered Ginger, Powdered Cinnamon, Powdered Caraway, Powdered Clove of each	1 oz.
Powdered Tragacanth	6 dr.
Powdered Sugar	3½ lb.
Mucilage of Acacia	4 fl. oz.
Distilled Water	8 ,,

Mass and cut 20 grain lozenges. Dry.

Cough Lozenges

1.

Morphine Hydrochloride	5 gr.
Powdered Ipecacuanha	½ oz.
Tartaric Acid	1 ,,
Powdered Senega root	½ ,,
Oil of Lemon	30 min.
Oil of Orange	20 ,,
Powdered Sugar	18 oz.
Powdered Acacia	400 gr.
Mucilage of Acacia	1¼ fl. oz.
Distilled Water	a sufficiency

Mass and divide into 500 lozenges. Dry.

2.

Diamorphine Hydrochloride	5 gr.
Powdered Ipecacuanha	½ oz.
Powdered Squill	¼ ,,
Extract of Liquorice	8 ,,
Oil of Anise	50 min.
Powdered Sugar	12 oz.
Powdered Acacia	½ ,,
Distilled Water	a sufficiency

Mass and divide into 500 lozenges. Dry.

3. Morphine Acetate . . 5 gr.
Codeine Phosphate . . 10 ,,
Balsam of Tolu . . 40 ,,
Powdered Ipecacuanha .200 ,,
Powdered Squill . .100 ,,
Oil of Anise . . . 30 min.
Oil of Cinnamon . . 5 ,,
Powdered Acacia . .300 gr.
Powdered Sugar . . 17 oz.
Mucilage of Acacia . . 1 fl. oz.
Distilled water . . . a sufficiency

Mass and divide into 500 lozenges. Dry.

4. Citric Acid, powder . . 1 oz.
Liquid Extract of Coltsfoot . 3 fl. oz.
Balsam of Tolu . . . 2 oz.
Linseed, Liquorice and Chlorodyne Mass . . 9 lb.

Mass and cut 35 grain lozenges. Dry.

Chlorodyne Lozenges

Chloroform . . . ½ oz.
Tincture of Capsicum . 40 min.
Oil of Peppermint . . 40 ,,
Powdered Sugar . . 2½ lb.
Mucilage of Acacia . . a sufficiency

Mass and cut 25 grain lozenges. Dry.

Heartburn Lozenges

Precipitated Chalk . . 8 oz.
Heavy Carbonate of Magnesia 6 ,,
Prepared Chalk . . . 8 ,,
Powdered Sugar . . 1½ lb.
Oil of Caraway . . 20 min.
Mucilage of Acacia . . a sufficiency

Mass and cut 20 grain lozenges. Dry.

Glyco-Gelatin for Pastilles (Lemon Flavour)

1. Transparent Sheet Gelatin . 12 oz.
Water . . . . 24 fl. oz.
Glycerin . . . . 30 oz.
Syrup of Lemon . . 6 fl. oz.
Soluble Essence of Lemon . ½ fl. dr.

Strain through a jelly bag.

2. Transparent Sheet Gelatin . 12 oz.
Distilled Water . . . 30 fl. oz.
Sugar (in lumps). . . . 6 oz.
Glycerin . . . . 30 oz. avoir.
Lemon Flavour . . . a sufficiency

Take a couple of fresh Lemons and rub gently on the lumps of Sugar, so that when the glands are broken most of the oil is absorbed. Dissolve in the water, and filter bright through Kieselguhr. In this soak the Gelatin. When softened add to the Glycerin, previously heated to 180° F. or thereabouts. Mix without creating air bubbles.

MIXTURES

Alterative or Blood Mixtures

The compounds sold under this heading are of the nature of salines, with or without Potassium Iodide, Arsenic, or other alterative. Most of the formulas contain some Sarsaparilla compound or Taraxacum, although these drugs are not now considered to possess any specific action.

1. Potassium Iodide . . 4 gr.
   Magnesium Sulphate . . 30 ,,
   Iron and Ammonium Citrate 8 ,,
   Spirit of Sal Volatile . . 10 min.
   Liquid Extract of Liquorice . 30 ,,
   Chloroform Water . to 1 fl. oz.

2. Potassium Iodide . . 4 gr.
   Potassium Bicarbonate . 8 ,,
   Potassium Acetate . . 5 ,,
   Compound Decoction of Sarsaparilla . . . . 1 fl. dr.
   Elixir of Saccharin . . 5 min.
   Peppermint Water . to 1 fl. oz.

3. Potassium Iodide . . 5 gr.
   Ammonium Chloride . . 5 ,,
   Potassium Bicarbonate . 10 ,,
   Liquid Extract of Sarsaparilla ½ fl. dr.
   Fowler's Solution of Arsenic . 3 min.
   Chloroform Water . to 1 fl. oz.

4. Ammonium Chloride . . 8 gr.
   Potassium Acetate . . 5 ,,
   Potassium Bicarbonate . 10 ,,
   Magnesium Sulphate . . 30 ,,
   Compound Decoction of Sarsaparilla . . . . 1 fl. dr.
   Cinnamon Water . to 1 fl. oz.

NOTE.—*Liquid Extract of Liquorice should only be included in slightly ammoniacal mixtures.*

The above doses are for adults.

Bronchitis and Asthma Mixtures

Mixtures of this type contain expectorants, as Ipecacuanha and diaphoretics, as Ammonium Acetate

combined with bronchial stimulants, as Ammonium Carbonate, Cubeb, Copaiba, &c.

NOTE.—Ipecacuanha Wine is preferred to Antimonial Wine as an expectorant, being less depressing. Opiates as a rule are contra-indicated.

1. Ammonium Carbonate . . 3 gr.
   Ipecacuanha Wine . . 10 min.
   Solution of Ammonium Acetate . . . 1 fl. dr.
   Tincture of Cubeb . . 30 min.
   Sweet Spirit of Nitre . . 20 ,,
   Chloroform Water . to 1 fl. oz.

2. Ammonium Carbonate . 3 gr.
   Tincture of Lobelia . . 8 min.
   Tincture of Senega . . 10 ,,
   Ipecacuanha Wine . . 10 ,,
   Solution of Ammonium Citrate . . . 1 fl. dr.
   Chloroform Water . to 1 fl. oz.

3. Spirit of Sal Volatile . . 20 min.
   Ipecacuanha Wine . . 10 ,,
   Tincture of Squill . . 10 ,,
   Potassium Citrate . . 15 gr.
   Syrup of Tolu . . . ½ fl. dr.
   Anise Water . . to 1 fl. oz.

4. Spirit of Sal Volatile . . 20 min.
   Solution of Ammonium Acetate . . . 1 fl. dr.
   Tincture of Belladonna . 5 min.
   Syrup of Tolu . . . ½ fl. dr.
   Ipecacuanha Wine . . 10 min.
   Tincture of Cubeb . . 20 min.
   Chloroform Water . to 1 fl. oz.

Infants' Cordial or Gripe Mixtures

These are generally very mild alkaline mixtures with carminatives, intended for the minor stomach disorders of children. Opium in any form is strongly to be deprecated. Sassafras and Pennyroyal Oils are also objectionable.

1. Sodium Bicarbonate . . 2 gr.
   Ammonium Carbonate . ¼ ,,
   Compound Tincture of Cardamoms . . . . 5 min.
   Compound Syrup of Rhubarb 10 ,,
   Dill Water . . . to 1 fl. dr.

2. Light Carbonate of Magnesia 2 gr.
   Sodium Bicarbonate . . 1 ,,
   Spirit of Chloroform . . 1 min.
   Glycerin . . . . 5 ,,
   Peppermint Water . to 1 fl. dr.

3. Sodium Bicarbonate . . 2 gr.
   Compound Tincture of Cardamoms . . . . . 5 min.
   Spirit of Camphor . . 1 ,,
   Spirit of Sal Volatile . . 2 ,,
   Syrup of Ginger . . . 5 ,,
   Anise Water . . . to 1 fl. dr.

4. Sodium Bicarbonate . . 2 gr.
   Potassium Bromide . . 1 ,,
   Spirit of Ether . . . 1 min.
   Syrup of Ginger . . 5 ,,
   Dill Water . . to 1 fl. dr.

The dose given (1 fl. dr.) is for a child under twelve months old.

Cold (Catarrh) and Influenza Mixtures

The basis of this class of remedies is practically a combination of diaphoretics, diffusible stimulants, and salines. As a cold often ends with a cough, it is generally well to incorporate an expectorant.

1. Solution of Ammonium Acetate . . . . 1 fl. dr.
   Spirit of Nitrous Ether . 30 min.
   Tincture of Aconite . . 3 ,,
   Compound Tincture of Camphor . . . . 20 ,,
   Ipecacuanha Wine . . 10 ,,
   Chloroform Water . to 1 fl. oz.

2. Potassium Citrate . . 30 gr.
   Potassium Nitrate . . 5 ,,
   Ipecacuanha Wine . . 10 min.
   Spirit of Chloroform . . 10 ,,
   Syrup of Squill . . . ½ fl. dr.
   Anise Water . . to 1 fl. oz.

3. Solution of Ammonium Citrate . . . . 1 fl. dr.
   Spirit of Sal Volatile . . 20 min.
   Tincture of Aconite . . 3 ,,
   Compound Tincture of Camphor . . . 30 ,,
   Syrup of Tolu . . . ½ fl. dr.
   Chloroform Water . to 1 fl. oz.

4. Potassium Citrate . . 20 gr.
   Ammonium Carbonate . 5 ,,
   Spirit of Ether . . . 15 min.
   Ipecacuanha Wine . . 10 ,,
   Syrup of Tolu . . . ½ fl. dr.
   Camphor Water . . to 1 fl. oz.

5. Ammoniated Tincture of Quinine . . . . 1 fl. dr.
   Solution of Ammonium Acetate . . . . 1 ,,
   Compound Tincture of Cardamoms . . . . ½ ,,
   Glycerin . . . . ½ ,,
   Chloroform Water . to 1 fl. oz.

Cough Mixtures

Simple cough mixtures should combine expectorants, carminatives, and sedatives with some diffusible stimulant. Opiates should not be given to young children.

For Adults

1. Ipecacuanha Wine . . 8 min.
   Elixir of Diamorphine and Terpin . . . ½ fl. dr.
   Syrup of Virginian Prune . ½ ,,
   Anise Water . . to 1 fl. oz.

2. Ipecacuanha Wine . . 10 min.
   Elixir of Diamorphine and Terpin . . . ½ fl. dr.
   Liquid Extract of Liquorice . 30 min.
   Tincture of Squill . . 8 ,,
   Camphor Water . . to 1 fl. oz.

3. Ipecacuanha Wine . . 8 min.
   Syrup of Codeia . . . ½ fl. dr.
   Syrup of Tolu . . . ½ ,,
   Chloroform Water . to 1 fl. oz.

4. Ipecacuanha Wine . . 8 min.
   Dilute Hydrobromic Acid . 10 ,,
   Syrup of Squill . . . ½ fl. dr.
   Syrup of Red Poppy . . ½ ,,
   Chloroform Water . to 1 fl. oz.

For Young Children

1. Ipecacuanha Wine . . 5 min.
   Dilute Hydrobromic Acid . 5 ,,
   Syrup of Tolu . . . 10 ,,
   Tincture of Senega . . 3 ,,
   Dill Water . . to 1 fl. dr.

2. Ipecacuanha Wine . . 5 min.
Syrup of Virginian Prune . 10 ,,
Syrup of Tolu . . . 10 ,,
Syrup of Red Poppy . . 10 ,,
Anise Water . . to 1 fl. dr.

Diarrhœa or Cholera Mixtures

Diarrhœa mixtures contain astringents, opiates, carminatives, intestinal antiseptics, and diffusible stimulants. Opiates should not be given to young children.

For Adults

1. Aromatic Chalk Powder . 30 gr.
Tincture of Catechu . . 30 min.
Compound Tincture of Cardamoms . . . . 30 ,,
Tincture of Opium . . 5 ,,
Syrup of Ginger . . . ½ fl. dr.
Chloroform Water . to 1 fl. oz.

2. Bismuth Salicylate . . 15 gr.
Chlorodyne . . . 10 min.
Syrup of Ginger . . . 1 fl. dr.
Compound Tincture of Camphor . . . . 30 min.
Distilled Water . . to 1 fl. oz.

3. Lead Acetate . . . 1 gr.
Tincture of Opium . . 5 min.
Spirit of Chloroform . . 20 ,,
Compound Tincture of Cardamoms . . . 30 ,,
Tincture of Capsicum . . 10 ,,
Pimento Water . . to 1 fl. oz.

4. Dilute Sulphuric Acid . . 15 min.
Tincture of Opium . . 5 ,,
Tincture of Capsicum . . 5 ,,
Syrup of Ginger . . . 1 fl. dr.
Clove Water . . to 1 fl. oz.

For Children

Aromatic Chalk Powder . 8 gr.
Tincture of Catechu . . 5 min.
Syrup of Ginger . . 10 ,,
Bismuth Salicylate . . 5 gr.
Dill Water . . . to 1 fl. dr.

For Infants, dose 10 to 30 drops.

Board of Health Cholera Mixture

Aromatic Chalk Powder	.	9 gr.
Spirit of Sal Volatile	.	9 min.
Tincture of Catechu	.	30 ,,
Compound Tincture of Cardamoms	.	18 ,,
Tincture of Opium	.	3 ,,
Chalk Mixture	to	1 fl. oz.

Gout and Rheumatism Mixtures

Numerous formulas have been published for this class of mixtures. Nearly all depend for their efficacy on salines combined with Potassium Iodide, Colchicum, Salicylates, &c.

1. Potassium Bicarbonate	.	20 gr.
Potassium Iodide	.	5 ,,
Colchicum Wine	.	10 min.
Syrup of Ginger	.	1 fl. dr.
Chloroform Water	to	1 fl. oz.
2. Potassium Bicarbonate	.	10 gr.
Sodium Salicylate	.	10 ,,
Tincture of Colchicum	.	10 min.
Compound Tincture of Gentian	.	½ fl. dr.
Cinnamon Water	to	1 fl. oz.
3. Sodium Salicylate	.	15 gr.
Tincture of Colchicum	.	10 min.
Potassium Citrate	.	15 gr.
Syrup of Orange	.	1 fl. dr.
Chloroform Water	to	1 fl. oz.
4. Solution of Ammonium Acetate	.	1 fl. dr.
Potassium Iodide	.	5 gr.
Spirit of Sal Volatile	.	20 min.
Lithium Citrate	.	5 gr.
Concentrated Infusion of Gentian	.	10 min.
Chloroform Water	to	1 fl. oz.

Indigestion Mixtures

The favourite combinations are alkalies, Bismuth salts, Pepsin, bitter tonics, and carminatives, with or without opiates and sedatives. Many of the formulas are unscientific, as they combine Pepsin with alkalies although the latter render the enzyme almost inert.

1. Glycerin of Pepsin . . 1 fl. dr.
   Tincture of Nux Vomica . 5 min.
   Concentrated Infusion of Gentian . . . . 10 ,,
   Chloroform Water . to 1 fl. oz.

2. Pepsin . . . . 5 gr.
   Dilute Hydrochloric Acid . 10 min.
   Compound Tincture of Gentian . . . . ½ fl. dr.
   Syrup of Orange . . . ½ ,,
   Solution of Strychnine . . 4 min.
   Chloroform Water . to 1 fl. oz.

3. Pepsin . . . . 3 gr.
   Papain . . . . 2 ,,
   Lactic Acid . . . 10 min.
   Syrup of Orange . . . ½ fl. dr.
   Distilled Water . . to 1 fl. oz.

4. Bismuth Carbonate . . 10 gr.
   Sodium Bicarbonate . . . 15 ,,
   Compound Tragacanth Powder . . . . 5 ,,
   Tincture of Nux Vomica . 5 min.
   Dilute Hydrocyanic Acid . 3 ,,
   Compound Tincture of Cardamoms . . . 20 ,,
   Glycerin . . . . ½ fl. dr.
   Chloroform Water . to 1 fl. oz.

5. Solution of Bismuth and Ammonium Citrate . . 30 min.
   Tincture of Nux Vomica . 5 ,,
   Compound Tincture of Gentian . . . . ½ fl. dr.
   Syrup of Ginger . . . ½ ,,
   Pancreatin . . . 2 gr.
   Spirit of Sal Volatile . . 10 min.
   Peppermint Water . to 1 fl. oz.

Tonic and Neuralgia Mixtures

These mixtures may be considered together.

1. Iron and Quinine Citrate . 10 gr.
   Compound Tincture of Gentian . . . . ½ fl. dr.
   Spirit of Chloroform . . 10 min.
   Tincture of Gelsemium . . 5 ,,
   Distilled Water . . to 1 fl. oz.

2. Quinine Sulphate . . 1 gr.
   Dilute Phosphoric Acid . 10 min.
   Tincture of Nux Vomica . 5 ,,
   Syrup of Orange . . ½ fl. dr.
   Chloroform Water . to 1 fl. oz.

3. Solution of Ferric Chloride . 10 min.
   Quinine Hydrochloride . 1 gr.
   Glycerin . . . . ½ fl. dr.
   Chloroform Water . to 1 fl. oz.

4. Iron and Quinine Citrate . 10 gr.
   Spirit of Chloroform . . 10 min.
   Tincture of Orange . . ½ fl. dr.
   Glycerin . . . . ½ ,,
   Distilled Water . . to 1 fl. oz.

5. Solution of Ferric Chloride . 10 min.
   Quinine Sulphate . . 1 gr.
   Tincture of Calumba . . 20 min.
   Magnesium Sulphate . . 10 gr.
   Syrup of Orange Flower Water . . . . ½ fl. dr.
   Spirit of Chloroform . . 10 min.
   Distilled Water . . to 1 fl. oz.

OINTMENTS

Chillie Paste

1. Capsicum, coarse powder . 4 oz.
   Spermaceti . . . 3 ,,
   Olive or Nut Oil . . 16 fl. oz.
   Oil of Lavender . . 20 min.

Digest the Capsicum in the Oil and Wax on a water bath for twenty-four hours. Strain, add the Lavender and cool.

2. Capsicum, coarse powder . 4 oz.
   White Petroleum Jelly . 1 lb.

Digest the Capsicum in the basis on a water bath for twenty-four hours. Strain through calico.

Comedone, or Blackhead Ointment

Camphor,
Resorcin,
Salicylic Acid,
Oil of Birch Tar . of each 10 gr.
Boric Acid Ointment (half strength) . . . 1 oz.

The affected part to be well bathed with warm water and dried. Afterwards apply the ointment.

Next morning the excess of grease should be removed with fine oatmeal, and the skin cleansed with warm water and gentle friction.

Eczema Ointment

1. Sulphur Ointment, Boric Ointment, Zinc Ointment — equal parts

2. Zinc Ointment . . . 7 dr.
   Sulphur Ointment . . 1 ,,
   Oil of Birch Tar . . . 10 gr.

3. Resorcin . . . . 20 gr.
   Water sufficient to dissolve
   Zinc Ointment . . . 1 oz.

Eye Ointment

For Granular Eyelids, &c.

Levigated Yellow Mercuric Oxide . . . . 8 gr.
Soft Yellow Paraffin . . 1 oz.

Healing Ointment

1. Benzoated Lard . . . 1 lb.
   Yellow Wax . . . 1 oz.
   Calamine . . . . 3 ,,
   Boric Acid . . . 1 ,,
   Oil of Clove . . . 30 min.

2. Zinc Ointment . . . 1 oz.
   Boric Ointment . . . 2 ,,

Indian Cerate

1. Prepared Chalk . . . 4 oz.
   Lard . . . . 1 lb.
   Peruvian Balsam . . 1 dr.

2. Beeswax, White . . . 4 oz.
   Spermaceti . . . 2 ,,
   Camphor . . . . 1 ,,
   Lard . . . . 4 ,,
   Olive Oil . . . 7 fl. oz.
   Lead Carbonate . . . ½ oz.
   Oil of Lemon . . . 20 min.

Itch Ointment

1. Sulphur Ointment . . 1 oz.
   Soft Soap . . . . ½ dr.
   Rectified Spirit . . . ½ ,,

Dissolve the Soap in the Spirit and mix with the Sulphur Ointment.

2. Compound Sulphur Ointment.

Nit Ointment or Nursery Pomade for Destroying Pediculi

1.	Stavesacre Ointment	1 oz.
	Oil of Bergamot	3 drops
2.	Red Mercuric Oxide Ointment	1 oz.
	Lard	½ ,,
	Oil of Lavender	3 drops
3.	Oil of Stavesacre	1 oz.
	Alkannin	1 gr.
	Benzoated Lard	8 oz.
	Yellow Wax	1 dr.
	Oil of Lavender	20 drops
	Oil of Clove	2 ,,
4.	Veratrine	1 gr.
	Soft Paraffin	1 oz.
	Oil of Lemon	3 drops
5.	Veratrine	2 gr.
	Oil of Stavesacre	1 oz.
	Soft Paraffin	1 dr.
	Vaseline	8 oz.
	Oil of Bergamot	10 drops
	Oil of Lemon	20 ,,
6.	Oil of Sassafras	1 fl. dr.
	Soft Paraffin	1 oz.

Pile Ointment

Most of the preparations in common use are deeply coloured, as Hamamelis or Gall and Opium Ointment. These stain the linen and are objectionable. The following have little colour :

1.	Tannic Acid	40 gr.
	Morphine	4 ,,
	Oleic Acid	30 ,,
	Lanolin	120 ,,
D.D.A.	Soft Paraffin	to 1 oz.
2.	Tannic Acid	40 gr.
	Cocaine	5 ,,
	Oleic Acid	30 ,,
	Lanolin	120 ,,
D.D.A.	Soft Paraffin	to 1 oz.

3. Glycerin of Lead Acetate . 2 fl. dr.
   Cocaine . . . . 6 gr.
   Morphine . . . . 2 ,,
   Camphor . . . . 10 ,,
   Oleic Acid . . . . 30 ,,
   Lanolin . . . . ½ oz.
D.D.A. Soft Paraffin . . . 1 ,,

4. Levigated Calomel . . ½ dr.
   Morphine . . . . 2 gr.
   Cocaine . . . . 4 ,,
   Oleic Acid . . . . 30 ,,
D.D.A. Soft Paraffin . . . 1 oz.

Pomade Divine

1. Purified Beef Marrow . . 1 lb.
   Siam Benzoin . . . 1 dr.

Digest on water bath for an hour and strain. Add—

   Coumarin . . . . 1 gr.
   Oil of Cassia,
   Oil of Clove
   Oil of Nutmeg . of each 15 min.

2. Prepared Marrow . . . 3 lb.
   Storax . . . . 4 oz.
   Benzoin . . . . 4 ,,
   Orris, bruised . . . 1 ,,
   Cinnamon, bruised . . ½ ,,
   Clove . . . . ½ ,,
   Nutmeg . . . . ½ ,,

Digest on water bath for three hours, strain, and filter.

Psoriasis Ointment

1. Ammoniated Mercury Ointment . . . . 1 oz.
   Salicylic Acid Ointment . 1 ,,
   Creosote . . . . 20 min.

2. Red Oxide of Mercury Ointment . . . . 1 oz.
   Salicylic Acid Ointment . 1 ,,
   Zinc Ointment . . . 1 ,,

Ringworm Ointment

1. Diluted Mercuric Nitrate Ointment.

2. Sulphur Iodide Ointment.

3. Salicylic Acid . . . 2 dr.
   Chrysarobin . . . 1 ,,
   Creosote . . . . 1 fl. dr.
   Benzoated Lard . . . 4 oz.
4. Carbolic Acid . . . 2 dr.
   Salicylic Acid . . . 1 ,,
   Mercuric Nitrate Ointment . 2 oz.
   Prepared Lard . . . 6 ,,
5. Coster's Paste.

To be applied sparingly and not over too large a surface.

6. 10 per cent. Mercury Oleate Ointment.

This is one of the best.

Scurvy Ointment

Boric Ointment . . 1 part
Carbolic Ointment . . 2 parts
Zinc Ointment . . . 3 ,,

Stainless Iodine Ointment with Methyl Salicylate

Stainless Iodine Ointment . 9 oz.
Strong Methyl Salicylate Ointment . . . 1 ,,

PICK-ME-UPS

1. Concentrated Compound Infusion of Gentian, 1–7 . 1½ fl. dr.
   Sodium Bicarbonate . . 15 gr.
   Spirit of Sal Volatile . . 20 min.
   Spirit of Chloroform . . 10 ,,
   Water . . . to 1½ fl. oz.
2. Sodium Bicarbonate . . 20 gr.
   Spirit of Sal Volatile . . 15 ,,
   Infusion of Gentian . to 1½ fl. oz.
3. Sodium Bicarbonate . . 20 gr.
   Spirit of Sal Volatile . . 20 min.
   Compound Tincture of Cardamoms . . . . 1 fl. dr.
   Syrup of Orange . . . 1 ,,
   Infusion of Gentian . to 1½ fl. oz.

Headache Draughts

1. Caffeine Citrate . . . 2 gr.
   Spirit of Sal Volatile . . 30 min.
   Spirit of Chloroform . . 15 ,,
   Tincture of Orange . . 30 ,,
   Water . . . to 1½ fl. oz.

2. Caffeine Citrate . . . 2 gr.
   Sodium Bromide . . 10 ,,
   Water . . . . 8 fl. oz.
   Effervescent Citrate of Magnesia . . . 2 teaspoonfuls

Drink while effervescing.

PILLS

The published formulas for the various pills in everyday use are so numerous that no attempt can be made to give anything like a selection in a work of this kind. General rules for combining drugs may, however, be briefly enunciated.

Aperient or Antibilious Pills

These should contain one or more cathartics, as Aloes, Jalap, Scammony, Colocynth, combined with a cholagogue, as Blue Pill, Calomel, Podophyllin, and carminatives to prevent griping, as Oil of Caraway, Oil of Clove, or Extract of Henbane.

Examples

1. Compound Extract of Colocynth . . . . 2 gr.
   Compound Rhubarb Pill . 1 ,,
   Powdered Scammony Resin ½ ,,
   Calomel . . . . ½ ,,
   Oil of Clove . . . ½ min.

2. Powdered Aloes . . . 1 gr.
   Powdered Colocynth . . ½ ,,
   Powdered Scammony . . ½ ,,
   Blue Pill . . . . ½ ,,
   Oleo-Resin of Ginger . ¼ ,,
   Powdered Soap . . . 1 ,,
   Extract of Nux Vomica . ⅛ ,,

3. Extract of Aloes . . ½ gr.
   Extract of Henbane . . ½ ,,
   Powdered Rhubarb . . 1 ,,
   Powdered Ipecacuanha . ½ ,,
   Podophyllin . . . ½ ,,
   Oil of Peppermint . . ½ min.

4. Compound Extract of Colocynth . . . . 2 gr.
   Powdered Jalap . . . ½ ,,
   Powdered Myrrh . . ½ ,,
   Calomel . . . . ½ ,,
   Powdered Black Pepper . ½ ,,
   Oil of Caraway . . ½ min.

Aperient Pills of the 'Little Liver' Type

5. Aloin . . . . . ½ gr.
   Jalapin . . . . . ¼ ,,
   Euonymin . . . . ¼ ,,
   Podophyllin . . . . ⅙ ,,
   Oleo-Resin of Capsicum . ⅙ ,,

Cold or Catarrh Pills

These generally contain Acetanilide, Phenazone, or Tincture of Aconite, with Camphor and a small dose of Opium, or Extract of Belladonna.

1. Tincture of Aconite (evaporated) . . . . 3 min.
   Camphor . . . . 1 gr.
   Powdered Ipecacuanha . ½ ,,
2. Powdered Ipecacuanha . ½ ,,
   Quinine . . . . ½ ,,
   Guaiacol Carbonate . . 2 ,,
3. Acetanilide . . . 1 gr.
   Extract of Belladonna . ¼ ,,
   Caffeine . . . . ½ ,,
   Quinine . . . . ½ ,,

Cough Pills

These ought to contain expectorants, as Ipecacuanha, Squill, Ammoniacum, Tolu, &c.

1. Powdered Ipecacuanha . 1 gr.
   Potassium Nitrate . . 2 ,,
   Camphor . . . . ½ ,,
2. Ammoniacum . . . 1 gr.
   Powdered Squill . . 1 ,,
   Powdered Ipecacuanha . 1 ,,
3. Powdered Ammoniacum . 2 gr.
   Powdered Ipecacuanha . 1 ,,
   Powdered Squill . . 1 ,,
4. Extract of Henbane . . 1 gr.
   Powdered Ipecacuanha . 2 ,,
   Tolu . . . . . 1 ,,
5. Codeia . . . . . ½ gr.
   Powdered Ipecacuanha . 1 gr.
6. Extract of Belladonna . ¼ gr.
   Powdered Ipecacuanha . 1 ,,
   Powdered Squill . . 1 ,,
   Tolu . . . . . ½ ,,

Diarrhœa Pills

These depend for their action on astringents, as Lead Acetate or Tannic Acid, with or without Opium, and carminatives, as Ginger, Capsicum, or a volatile oil.

1. Lead and Opium Pill . . 3 gr.
   Powdered Capsicum . . ¼ ,,
   Oil of Clove . . . ½ min.

2. Tannic Acid . . . 1 gr.
   Lead and Opium Pill . 2 ,,
   Extract of Belladonna . ¼ ,,
   Camphor . . . . 1 ,,

Digestive Pills

The pills sold under this heading are to all intents and purposes 'Aperient Pills,' sometimes containing Pancreatin or Pepsin and a *stomachic stimulant*, as Nux Vomica.

1. Compound Rhubarb Pill . 2 gr.
   Compound Extract of Colocynth . . . . 1 ,,
   Extract of Nux Vomica . ¼ ,,

2. Extract of Aloes . . . ¼ gr.
   Extract of Nux Vomica . ¼ ,,
   Oleo-Resin of Ginger . . ¼ ,,
   Pepsin . . . . 3 ,,

3. Aloin . . . . ½ gr.
   Dried Sodium Carbonate . 3 ,,
   Pancreatin . . . 2 ,,
   Extract of Nux Vomica . ¼ ,,

4. Powdered Rhubarb . . 2 gr.
   Powdered Aloes . . . ½ ,,
   Extract of Belladonna . . ¼ ,,
   Extract of Nux Vomica . ¼ ,,

Dinner Pills

These are mild aperients combined with bitter tonics.

1. Aloin . . . . ½ gr.
   Extract of Belladonna . . ¼ ,,
   Powdered Ipecacuanha . ¼ ,,
   Powdered Mastic . . 1 ,,
   Extract of Gentian . . 1 ,,
   Oil of Caraway . . ¼ drop

2. Powdered Aloes . . . ½ gr.
Powdered Rhubarb . . 1 ,,
Powdered Ipecacuanha . ¼ ,,
Extract of Nux Vomica . ¼ ,,
Oleo-Resin of Capsicum . ⅛ ,,
Powdered Soap . . . 2 ,,

Female Pills

(*Steel and Pennyroyal Pills*)

The pills sold under this name are practically aperient pills. They generally contain a small dose of Iron with a trace of Oil of Pennyroyal.

1. Powdered Aloes . . 1 gr.
Powdered Myrrh . . 1 ,,
Compound Extract of Colocynth . . . 2 ,,
Ferrous Sulphate . . ½ ,,
Oil of Pennyroyal . . ¼ drop

2. Compound Rhubarb Pill . 2 gr.
Compound Extract of Colocynth . . 2 ,,
Extract of Belladonna . . ½ ,,
Dried Ferrous Sulphate . ½ ,,
Oil of Pennyroyal . . ¼ drop

Gout and Rheumatism Pills

The virtue of these pills depends chiefly upon Colchicum. Nearly all contain a purgative and cholagogue. Some contain an alterative as Potassium Iodide.

1. Extract of Colchicum . . ½ gr.
Compound Rhubarb Pill . 3 ,,
Guaiacum Resin . . 1 ,,

2. Powdered Colchicum Seeds 3 gr.
Aloin . . . . ½ ,,
Calomel . . . . ½ ,,

3. Colchicin Salicylate . . 1/20 gr.
Guaiacum Resin . . 2 ,,
Potassium Iodide . . 3 ,,

4. Extract of Colchicum . . ½ gr.
Euonymin . . . ½ ,,
Compound Extract of Colocynth . . . 2 ,,
Calomel . . . . ½ ,,
Methyl Salicylate . . ¼ drop

Kidney or Backache Pills

(*Diuretic, Gravel Pills*)

Diuretics and stimulants of the urinary tract constitute the active principles. Many formulas contain in addition some purgative.

1.	Powdered Squill	$\frac{1}{2}$ gr.
	Powdered Digitalis	$\frac{1}{2}$,,
	Potassium Nitrate	2 ,,
	Extract of Buchu	$\frac{1}{2}$,,
	Oil of Juniper	$\frac{1}{2}$ drop
2.	Powdered Aloes	1 gr.
	Extract of Buchu	1 ,,
	Powdered Squill	$\frac{1}{2}$,,
	Powdered Resin	1 ,,
	Powdered Soap	1 ,,
3.	Potassium Nitrate	2 gr.
	Oil of Juniper	$\frac{1}{2}$ drop
	Oil of Buchu	$\frac{1}{4}$,,
	Aloes	$\frac{1}{2}$ gr.
	Guaiacum Resin	2 ,,
4.	Oleo-Resin of Cubeb	1 gr.
	Powdered Squill	$\frac{1}{2}$,,
	Caffeine	1 ,,
	Compound Colcynth Pill	2 ,,

Liver Pills

See APERIENT OR ANTIBILIOUS PILLS

Neuralgia or Tic Pills

The older formulas for neuralgia pills contained Iron, Quinine and other tonics as the active ingredients, and these drugs are still retained in many of the published recipes. Butyl Chloral Hydrate, Valerian, Gelsemine, Acetanilide, &c., which have a more specific action, are now, however, included.

1.	Acetanilide	2 gr.
	Caffeine	1 ,,
	Extract of Belladonna	$\frac{1}{4}$,,
	Extract of Nux Vomica	$\frac{1}{4}$,,
2.	Dried Ferrous Sulphate	1 gr.
	Quinine Sulphate	1 ,,
	Zinc Valerianate	2 ,,
	Aloin	$\frac{1}{2}$,,
3.	Gelsemine Hydrochloride	$\frac{1}{60}$ gr.
	Butyl Chloral Hydrate	3 ,,
	Tincture of Aconite (evaporated)	3 min.

4.	Reduced Iron	2 gr.
	Strychnine	$\frac{1}{32}$,,
	Quinine Sulphate	1 ,,
	Extract of Gentian	2 ,,
5.	Acetanilide	2 gr.
	Quinine Sulphate	1 ,,
	Butyl Chloral Hydrate	2 ,,
6.	Extract of Indian Hemp	$\frac{1}{4}$ gr.
	Quinine Sulphate	1 ,,
	Ferrous Phosphate	2 ,,
	Caffeine	1 ,,

Tonic Pills

These are generally mixtures of the bitter tonics with Iron, Phosphorus, &c.

1.	Phosphorus	$\frac{1}{32}$ gr.
	Quinine Sulphate	1 ,,
	Extract of Nux Vomica	$\frac{1}{4}$,,
2.	Quinine Phosphate	1 gr.
	Strychnine Phosphate	$\frac{1}{32}$,,
	Extract of Belladonna	$\frac{1}{4}$,,
3.	Ferrous Sulphate	2 gr.
	Aloin	$\frac{1}{2}$,,
	Quinine Sulphate	1 ,,
	Extract of Nux Vomica	$\frac{1}{4}$,,
4.	Reduced Iron	2 gr.
	Aloin	$\frac{1}{2}$,,
	Extract of Chamomile	2 ,,
	Strychnine	$\frac{1}{32}$,,

Pill Coatings

Keratin

Keratin *prepared with Pepsin*	1 oz.
Solution of Ammonia, ·880	5 fl. oz.
Absolute Alcohol	5 ,,

Salol

Melt a little Salol in a porcelain dish, and rotate the pills. (The pills must be hard, dry, and free from adhering powder.)

Remove to a clean dish, warm until the Salol just begins to melt, and rotate until cold. This should give a smooth and polished coating.

Gelatin

Transparent Sheet Gelatin	2 oz.
Mucilage of Acacia	2½ fl. oz.
Glycerin	2 fl. dr.
Distilled Water	to 10 oz.
Boric Acid	20 gr.
Caramel	2 fl. dr.

Pill Varnishes

Sandarac

Sandarac	4½ oz.
Chloroform	4½ fl. oz.
Methylated Ether, ·717	9 „

Tolu

Spent Tolu, dried	6 oz.
Chloroform	4 fl. oz.
Methylated Ether, ·717	8 „

Salol

Salol	4 parts
Tannic Acid	1 part
Methylated Ether	20 parts

SNUFFS

Menthol Snuff

1.	Menthol	30 gr.
	Powdered Boric Acid	30 „
	Bismuth Oxychloride	30 „
	Lycopodium	½ oz.
2.	Menthol	30 gr.
	Camphor	30 „
	Boric Acid Powder	1 oz.
	Lycopodium	1 „

Adrenalin Snuff

Adrenalin	1 gr.
Camphor	20 „
Menthol	60 „
Potassium Chlorate	120 „
Boric Acid	240 „
Lycopodium	2 oz. troy
Eucalyptol	10 drops

MEDICATED SOAPS

Plain (Cocoa-nut Oil) Soap

Cocoa-nut Oil . .	900 grammes
Soda Lye (10° Baume) .	600 „

The soda lye is boiled in a porcelain vessel, and the oil gradually added, without stopping the heating. When the mixture has become smooth, 375 grammes of soda lye (20° Be.) is added. The mass now becomes thicker; the heating is stopped when a small sample solidifies on cooling. About ½ litre of water is then added, the whole heated to boiling, and 375 grammes of common salt added, when the soap will separate and rise to the surface. The mixture is then cooled, the water poured off, the mass mixed twice with a 20 per cent. salt solution, and finally with cold water. The water is allowed to drain off in a hair sieve, and the mass pressed to remove the excess of water. The soap so obtained is in the form of a paste, which is brought to a suitable consistence by a very moderate heat in a drying-oven, in order to enable the selected medicament to be incorporated, after which the soap is pressed into tablets and dried at a temperature of from 30° to 35° C.

Borax Soap

It is best to prepare this soap by adding 100 grammes of Borax to 900 grammes of Cocoa-nut Oil Soap, mixing until a homogeneous mass is obtained, then cutting into pieces of 100 grammes each, and pressing and drying the tablets.

Carbolated Soap

Cocoa-nut Oil Soap . .	950 grammes
Carbolic Acid . . .	50 „
Alcohol	25 „

The Carbolic Acid is dissolved in the Alcohol, and the solution gradually added to the Soap. When the mixture is homogeneous, it is cut and pressed into tablets.

Ichthamol Soap

Ichthamol soap is prepared as above, from 100 grammes of Ichthamol and 900 grammes of Cocoa-nut Oil Soap.

Naphthol Soap

Naphthol soap is prepared like borax soap, using 900 grammes of Cocoa-nut Oil Soap and 100 grammes of β-Naphthol.

Sublimate Soap

Five grammes of Corrosive Sublimate are dissolved in 30 grammes of Alcohol ; the solution is filtered, and then added to the Soap as in the case of carbolated soap.

Sulphur Soap

Cocoa-nut Oil Soap . .	900 grammes
Sublimed Sulphur, finely sifted	100 ,,

A mixture of these is made and treated as under borax soap.

Tar Soap

Beechwood Tar . . .	100 grammes
Cocoa-nut Oil Soap . .	900 ,,

The Tar is placed in a mortar, and the Soap gradually added, with constant trituration, until a uniform mass is obtained when it is pressed into tablets.

Theobroma Soap

Oil of Theobroma . .	100 parts

Melt and add to—

Warm Solution of Sodium Hydroxide, sp. gr. 1·34 .	85 parts

Stir well and allow to stand for forty-eight hours. Warm on water bath until a clear solution results. Add—

Water	50 parts

and salt out the soap by the addition of about 50 parts Sodium Chloride. Heat to complete separation. Cool, remove the layer of soap, press strongly, break into small pieces, wash with 50 parts water, again press, break up into small pieces, and dry by gentle heat.

Another method for the extemporaneous preparation of medicated soaps is to incorporate the medicaments with Soap Powder and mass with 60 per cent. Alcohol as described in the following—

Benzoin Soap

Benzoin	¼ oz.
Vanillin	1 gr.
Coumarin	1 ,,
60 per cent. Alcohol . .	3½ fl. oz.
Powdered Curd Soap . .	10 oz.
Powdered Castile Soap .	10 ,,

Mass and divide into tablets. Dry at air temperature for several days.

Ichthamol, Sulphur, and Tar Soap

Powdered Castile Soap	40 parts
Powdered Curd Soap	40 ,,
Ichthamol	5 ,,
Stockholm Tar	2½ ,,
60 per cent. Alcohol	10 ,,

Mass as above.

SUPPOSITORIES, BOUGIES, CAPSULES, &c.

Basis for Gelatin Capsules

1. Gelatin	1 lb.
Mucilage of Acacia	8 fl. oz.
Glycerin	16 ,,
Water	40 ,,
Caramel	a sufficiency
2. Gelatin	1 lb.
Water	30 fl. oz.
Glycerin	16 ,,
Caramel	a sufficiency

Basis for Urethral Bougies

Gelatin	3½ oz.
Glycerin	1 fl. oz.
Distilled Water	5 ,,
Fresh Mucilage of Acacia (made with Lime Water)	4 ,,

After medicating and pouring, cool and hang by fine hooks from a string, in an atmosphere free from dust, at a temperature of about 70° F., for twenty-four hours or until sufficiently hard.

If the ends are not rounded, dip in hot water for a second.

Tannic Acid Suppositories

(Gelatin Basis)

Sheet Gelatin	10 parts
Tannic Acid	3 ,,
Distilled Water	15 ,,
Glycerin	60 ,,

Dissolve the Tannic Acid in cold water; add the Gelatin, and leave in contact until the solution is all absorbed. Warm the Glycerin, and add to the Gelatin Tannin; when dissolved, pour into moulds.

Suppository Basis

Anhydrous Wool Fat	1 part
Oil of Theobroma	99 parts

Melt together and stir while cooling. This gives a tough basis, with which extracts, liquids, &c., can be readily incorporated.

Glycerin Suppositories

(*Stearic Acid Basis*)

Stearic Acid	2½ dr.
Sodium Carbonate	75 gr.
Glycerin	5 oz. avoir.

Melt the Stearic Acid with the Glycerin and add the Carbonate. Stir well. Pour the clear mixture into moulds.

The suppositories, which should be quite clear, contain 95 per cent. Glycerin.

SYRUPS

Cascara Laxative Syrup

Fluid Extract of Cascara	4 fl. oz.
Syrup of Senna	6 ,,
Syrup of Orange	4 ,,
Fluid Extract of Malt	to 1 pint

Dose : One to two teaspoonfuls.

Compound Syrup of Fig

Syrup of Senna Pods	16 fl. oz.
Simple Syrup of Fig	1 oz.
Essence of Vanilla	10 drops

Concentrated Solution for Easton's Syrup

A.	Iron Wire	600 gr.
	Phosphoric Acid 1·50	10 fl. oz.
	Distilled Water	to 20 ,,
B.	Strychnine	40 gr.
	Quinine Sulphate	1,040 ,,
	Hypophosphorous Acid	10 fl. dr.
	Distilled Water	to 20 fl. oz.

Directions.—One part of each to be mixed with 6 parts of Syrup.

Red Marrow Syrup with Formate

Glycerin Extract of Red Bone Marrow		5 fl. oz.
Sodium Formate		240 gr.
Fluid Extract of Malt	to	1 pint

Red Marrow Syrup with Glycerophosphates

Glycerin Extract of Red Bone Marrow		5 fl. oz.
Sodium Glycerophosphate (50 per cent.)		1 fl. dr.
Potassium Glycerophosphate (50 per cent.)		1 ,,
Calcium Glycerophosphate		1 dr.
Manganese Glycerophosphate		½ ,,
Fluid Extract of Malt	to	1 pint

Red Bone Marrow Chemical Food

Chemical Food (Parrish)		10 fl. oz.
Glycerin Extract of Red Bone Marrow		5 ,,
Fluid Extract of Malt	to	1 pint

Syrup of Glycerophosphates

(Dr. Robin)

Calcium Glycerophosphate		1½ dr.
Sodium Glycerophosphate		2 ,,
Potassium Glycerophosphate		½ ,,
Magnesium Glycerophosphate		½ ,,
Iron Glycerophosphate		15 gr.
Pepsin		45 ,,
Diastase		15 ,,
Tincture of Ignatia Seed		30 min.
Tincture of Kola Seed		2½ dr.
Syrup of Cherry	to	7 oz. wt.

Syrup of Lobelia

Vinegar of Lobelia	10 fl. oz.
Sugar	1 lb.

Dissolve.

WINES, MEDICATED

NOTE.—These may only be sold without a wine licence when sufficient medicament is present to render them unfit for beverages.

Kola Wine (Excisable)

Miscible Liquid Extract of Kola	. . .	5 fl. oz.
Port or Sherry Wine	. .	1 gal.
Leaf Gelatin	. . .	1 oz.

Macerate for a fortnight, frequently shaking, and decant.

Meat and Malt Wine (Excisable)

Extract of Meat	. . .	2 oz.
Liquid Extract of Malt	.	2 pints
Port Wine	. . to	1 gal.
Salicylic Acid	. . .	2 gr.
Leaf Gelatin	. . .	1 oz.

Macerate, &c., as above.

Meat, Malt, and Iron Wine (Excisable)

Extract of Meat	. . .	2 oz.
Liquid Extract of Malt	.	2 pints
Ammonio-Citrate of Iron		320 gr.
Port Wine	. . to	1 gal.
Salicylic Acid	. . .	2 gr.
Leaf Gelatin	. . .	1 oz.

Macerate, &c., as above.

Meat, Malt, and Cinchona Wine (Excisable)

Extract of Meat	. .	2 oz.
Liquid Extract of Malt	.	2 pints
Liquid Extract of Cinchona	.	1 fl. oz.
Port Wine	. . to	1 gal.
Salicylic Acid	. . .	2 gr.
Leaf Gelatin	. . .	1 oz.

Macerate, &c., as above.

Pepsin Wine

Soluble Scale Pepsin	. .	6 oz.
Strong Hydrochloric Acid	.	1 fl. oz.
Glycerin	. . .	10 ,,
Detannated Sherry Wine	to	1 gal.

Detannated Wine

Sheet Gelatin	. . .	1 oz.
Wine	. . .	1 gal.

Macerate for fourteen days, shaking occasionally. Decant.

SMELLING SALT

Anti-Catarrh or Carbolised Smelling Salt

Ammonium Carbonate, in powder,
Willow Charcoal, in powder
of each equal parts

Mix, and damp thoroughly with the following mixture—

Liquefied Carbolic Acid,
Rectified Spirit,
Strong Solution of Ammonia, ·880,
Oil of Eucalyptus of each equal parts

Smelling Salt

Ammonium Carbonate, in lumps the size of filberts	2½ lb.
Solution of Ammonia sp. gr. ·880	1 pint
Oil of Lavender	1 fl. dr.
Oil of Clove	15 min.

Place in a jar with a good bung that has been soaked in melted Paraffin ; stand for twenty-eight days, stirring thoroughly every morning.

Inexhaustible Smelling Salt

Ammonium Chloride	2 oz.
Potassium Carbonate	5 dr.

Mix and add any Volatile Essence, as 1, 2, 3, *below*, with 5 per cent. of Glycerin to ensure the powder remaining damp.

Lavender Smelling Salt

Small size Sal Prunella Balls	sufficient to fill the bottle
Volatile Essence No. 2	a sufficiency

Tint with an aniline dye.

If desired, pea-size crystals of Potassium Sulphate may be used.

Volatile Essences for Smelling Bottles

1. Essence of Eau de Cologne	1 dr.
Alcoholic Ammonia, of sufficient strength to dissolve the oils, to	1 fl. oz.

2. Oil of Neroli . . . 10 min.
   Oil of Lavender . . . 30 „
   Oil of Clove . . . 5 „
   Strong Alcoholic Ammonia to 1 fl. oz.
3. Oil of Bergamot . . . 50 min.
   Oil of Lemon . . . 15 „
   Oil of Ylang Ylang . . 5 „
   Oil of Rose . . . 2 „
   Essence of Musk . . 10 „
   Strong Alcoholic Ammonia to 2 fl. oz.

Aromatic Vinegar Smelling Salt

Pea-size Crystals of Potassium Sulphate . . . a sufficiency
Aromatic Vinegar (*q.v.*), made with Glacial Acetic Acid . a sufficiency

Tint with an aniline dye.

MISCELLANEOUS

Lac Bismuthi

Bismuth Subnitrate . .800 gr.
Nitric Acid . . . 3 fl. oz.
Distilled Water . . . 3 „

Dissolve, and pour very slowly into—

Caustic Soda . . .300 gr.
Distilled Water . . . 2 gals.

Stir all the time. Wash precipitate by decantation. Drain on calico, squeeze, and mix with—

Glycerin . . . 2 fl. oz.

Add—

Chloroform Water,
Orange Flower Water of each equal parts to 1 pint

Keep in the dark, or in amber bottles.

Jarisch's Ointment

Pyrogallol . . . . 1 dr.
Prepared Lard . . . 1 oz.

Squire's Aseptic Wax

Beeswax . . . . 87 parts
Almond Oil . . . 12 „
Salicylic Acid . . . 1 part

Heat to 150° C. Keep in sterilised bottles under Mercuric Chloride Solution 1 in 1,000.

Collodium Salol

Salol	4 parts
Ether	4 ,,
Collodion	30 ,,

Michel's Paste

Asbestos Powder	1 part
Sulphuric Acid	3 parts

Glycerin of Iron Iodide

Solution of Ferrous Iodide for Syrup, 1 to 7	1 part by measure
Glycerin	7 parts by measure

Glucanth (Pill Excipient)

Powdered Tragacanth	4 dr.
Glycerin	1½ fl. oz.
Glucose	3 ,,

Mix rapidly, and add—

Distilled Water	6 fl. dr.

Mix quickly. This binds much better than Glycerin of Tragacanth.

Hebra's Diachylon Ointment

Lead Plaster	4 oz.
Olive Oil	4 ,,

Melt together, cool, and add—

Oil of Lavender	1 fl. dr.

Unna's Ichthyol Paste

Starch	40 parts
Water	20 ,,
Ichthyol	40 ,,
Egg Albumen	1 part

Mix. Do not heat.

Unna's Depilatory Sticks

Resin	9 parts
Beeswax	1 part

Melt together, and cast into pencils.

Unna's Zinc-Gelatin

Gelatin	10½ oz.
Water	32 ,,
Zinc Oxide	10½ ,,
Glycerin	14 fl. oz.
Resorcin	150 gr.

Pick's Varnish

Powdered Tragacanth	5 parts
Glycerin	2 ,,
Water	100 ,,

Pagenstecher's Spiritus Ophthalmicus

Spirit of Melissa	9½ fl. oz.
Spirit of Lavender (1 in 50)	2½ ,,
Spirit of Camphor	2½ fl. dr.
Spirit of Nitrous Ether	1½ ,,

Collyrium Adstringens Luteum

Ammonium Chloride	5 parts
Zinc Sulphate	12 ,,
Camphor	4 ,,
Tincture of Saffron	20 ,,
90 per cent. Alcohol	148 ,,
Distilled Water	2000 ,,

Witch-Hazel Snow or Foam

1. (*a*)

Agar-Agar	180 gr.
Distilled Water	8 fl. oz.
Distilled Solution of Hamamelis, B.P.	12 ,,

Allow to stand for a few days, with occasional stirring until softened. Strain through muslin.

(*b*)

Stearic Acid	360 gr.
Oil of Theobroma	360 ,,
Sodium Carbonate	240 ,,
Distilled Water	12 fl. oz.

Heat together on a water bath, stirring constantly, until combination is completed; transfer to a large jar, and whip in solution (*a*) with an egg whisk until a white foamy product results. Perfume to taste. Allow to stand fourteen days for air-bubbles to escape, mix gently, and bottle. Large quantities may be made in an emulsifying machine.

2.

Stearic Acid	2 oz.
Glycerin	2 fl. dr.
Sodium Carbonate	180 gr.
Water to produce	10 fl. oz.

Melt the Stearic Acid, and add to the hot solution of Glycerin and Sodium Carbonate. Keep on a water bath, frequently stirring, for an hour, making up the loss by evaporation. Finally add—

Distilled Solution of Hamamelis	10 fl. oz.

Transfer to a hot mortar, and agitate very thoroughly with an egg whisk, continuing until quite thick. Stand for twenty-four hours, and again stir until smooth, but do not beat in air. Bottles must be well corked to prevent evaporation.

Witch-Hazel Jelly

Sheet Gelatin	1 oz.
Glycerin	3 fl. oz.
Distilled Extract of Witch-Hazel	16 ,,

Soak the Gelatin in the Witch-Hazel until softened. Dissolve by very gentle heat. Add the Glycerin and—

Extract of Jasmin or Tuberose	½ fl. oz.

Witch-Hazel Cream

Anhydrous Wool-fat	2½ lb.
Almond Oil	1 pint

Melt together on water bath, and add gradually—

Distilled Solution of Witch-Hazel	1 pint
Otto of Rose	10 drops

Prevention of Gelatinisation of Tincture of Kino and Tincture of Red Gum

Place the Tincture in a tinned can. Cork tightly and tie down. Immerse the can in boiling water for one hour. Leave sufficient room for expansion. There is no danger from bursting, as but small pressure is exerted.

Toughening Filter Paper for Filter-pump Work

Dip the apex of a folded Swedish filter in Nitric Acid (sp. gr. 1·42) for five seconds. Wash well with distilled water.

The paper is toughened enormously, while the permeability is not materially affected.

Court Plaster

Isinglass	1 oz.
Water	1 pint
Rectified Spirit	1 fl. oz.
Glycerin	½ ,,

Soak the Isinglass in a little water for an hour or so. Add the remainder of water boiling. Dissolve, cool; add when cool the Glycerin and Alcohol.

Stretch the silk on a frame and apply successive coats, allowing each to dry before adding the next.

Do not use artificial heat to accelerate drying, or plaster will become streaky.

Styptic Colloid

1. Tannic Acid	2	oz.
90 per cent. Alcohol	2	fl. oz.

Dissolve, and pour into—

Flexible Collodion	15	fl. oz.
2. Ferric Chloride	1	dr.
30 per cent. Alcohol	½	fl. oz.

Dissolve, and add to—

Flexible Collodion	15	fl. oz.

Dutch (or Haarlem) Drops

Many formulas have been published, but the first given below is the one generally used :

1. Balsam of Sulphur	2	oz.
Oil of Turpentine	8	fl. oz.
2. Sulphurated Oil	12	fl. oz.
Barbadoes Tar	4	,,
Oil of Amber	6	,,
Oil of Turpentine	32	,,
Linseed Oil	16	,,

Fumigating Paper Tincture

Benzoin	50	grammes
Balsam of Tolu	50	,,
Storax	10	,,
Alcohol	300	,,

Make a tincture, filter and add—

Oil of Lavender	20	drops
Oil of Cassia	20	,,

Carron Oil

Olive Oil, Lime Water	of each	equal parts

Shake.

Godfrey's Cordial

Treacle		3½ lb.
Water		5 pints

Dissolve by heat, cool, and add—

Rectified Spirit		8 fl. oz.
Camphor		30 grains
Oil of Anise		
Oil of Sassafras		
Oil of Caraway	of each	30 min.

Eau des Carmes (Eau de Melisse)

Fresh Flowering Balm	24 oz.
Fresh Lemon Peel	4 ,,
Cinnamon	2 ,,
Cloves	2 ,,
Nutmeg	2 ,,
Coriander	1 ,,
Angelica Root	1 ,,
Rectified Spirit	1 gal.
Distilled Water	1 pint

Macerate the bruised materials for seven days. Distil 1 gallon.

Arquebusade Water

Balm		
Rosemary		
Thyme		
Calamus Root		
Angelica Seeds		
Lavender	of each	4 oz.
Rectified Spirit		3 pints
Water		2 ,,

Macerate for seven days, and distil 4 pints.

Sterilised Gelatin Solution for Hypodermic Injection

Fine Sheet Gelatin	10 parts
Sodium Chloride	7 ,,
Distilled Water	about 750 ,,

Dissolve by gentle heat on water bath. Test with litmus paper, and if acid, neutralise with $\frac{N}{10}$ NaOH, and make up to 1,000 parts with distilled water. Place in a flask, and heat in an autoclave to 110° C. for ten minutes. Filter the hot liquid through a sterilised filter into small sterilised flasks. Afterwards heat the flasks in the autoclave for fifteen minutes and plug.

Nesbit's Specific (Mist. Santal. Co.)

Oil of Copaiba	4 fl. dr.
Oil of Sandalwood	12 ,,
Oil of Cassia	1 ,,
Oil of Pimento	2 ,,
Rectified Spirit	to 8 fl. oz.

Concentrated Medicated Waters (1 in 40)

These are not very satisfactory preparations, but their general formula is as follows :

Essential Oil	2 fl. dr.
Rectified Spirit	10 fl. oz.
Distilled Water	6 ,,

Mix and shake occasionally during a week. Filter bright by aid of Kieselguhr.

Water-bath Solutions

Various salts dissolved in water materially raise the boiling point and thus afford a means of maintaining a steady temperature many degrees above 212° F.

Saturated Solution Sodium Nitrate boils at 246° F.
Saturated Solution Rochelle Salt boils at 240° F.
Saturated Solution Saltpetre boils at 238° F.
Saturated Solution Common Salt boils at 224° F.
Saturated Solution Epsom Salt boils at 222° F.

Prepared Cochineal

Powdered Cochineal	4 oz.
Potassium Carbonate	4 ,,
Cream of Tartar	4 ,,
Powdered Alum	4 ,,
Saturated Solution of Tartaric Acid	a sufficiency
Glycerin	16 fl. oz.
Distilled Water	16 ,,

Mix Glycerin and water, add Cochineal and Carbonate, and heat to 160° F. ; add Alum, and, when dissolved, the Cream of Tartar ; strain, and if necessary neutralise with Tartaric Acid solution.

Red Oil for Colouring

Alkanet Root	2 oz.
Olive Oil	2 pints

Heat on water bath for four hours and strain through double fold of flannel.

Benzoinated Liquid Paraffin

Fine Benzoin . . .	1 oz.
Liquid Paraffin (sp. gr. ·860)	1 pint

Digest on water bath for one hour, stirring occasionally. Filter through a little animal Charcoal.

This is suitable for atomisers.

Divine Stone (Lapis Divinus)

Potash Alum,	
Copper Sulphate,	
Potassium Nitrate	of each 1 part
Alum	3 parts

Fuse together and pour on a stone slab.

Pigmentum Chrysarobini (G. H.)

Chrysophanic Acid . .	1 part
Solution of Gutta Percha, B.P. 1885 . . .	9 fl. parts

Beef Peptonoids (Gerrard)

Minced Lean Beef . .	1 lb.
Pepsin	1 dr.
Diluted Hydrochloric Acid .	2 fl. dr.
Water	1 pint

Digest for three hours at 130° F. Neutralise with Bicarbonate of Soda.

Majendie's Iodine Solution

Iodine	2 gr.
Potassium Iodide .	240 ,,
Peppermint Water .	to 6 fl. oz.

Dose: 1 fl. dr.

Rother's Ammonium Valerianate Solution

Tasteless and Odourless

Ammonium Valerianate	119 gr.
Sodium Borate Powder	191 ,,
Solution of Ammonia	. a sufficiency
Distilled Water . . .	to 8 fl. oz.

Mix the Ammonium Valerianate with 1 oz. of the water, and add the Ammonia drop by drop until a clear solution is effected; add 2 fl. oz. more water and the Borate. Dissolve, filter, and make up to 8 fl. oz.

Fruit Elixirs

For the extemporaneous preparation of elixirs to be used for flavouring purposes, there is perhaps no quicker method than exhausting well-made household jams with dilute alcohol.

Take of—

Black Currant Jam (for instance) . . .	1 lb.
Alcohol (45 per cent.) . .	1 pint

Mix and macerate for a day or two; strain; press (avoid contact with iron) and filter.

Normal Saline Solution

Sodium Chloride, pure . .	80 gr.
Distilled Water . . .	1 pint

Dissolve, strain and sterilise.

Vinegar of Lobelia

Lobelia Seed, powder .	2 oz.
Acetic Acid, 33 per cent. .	2 fl. oz.
Water	1 pint

Extract by the percolation process.

Raspberry Vinegar

1. Fresh Raspberry Juice . 1 pint
   Malt Vinegar . . . 1 ,,
   Sugar . . . . 4 lb.

Dissolve, bring to boil, strain through flannel, and make up with water to 6½ lb.

2. Malt Vinegar . . . ½ pint
   Sugar . . . . 1 lb.

Dissolve in cold, and add—

Syrup of Raspberry . . 1 pint

Bismuthated Magnesia

Bismuth Carbonate . .	2 oz.
Sodium Bicarbonate . .	10 ,,
Magnesium Carbonate, heavy	12 ,,

PART V

TOILET PREPARATIONS

INTRODUCTORY

The use of duty-paid Rectified Spirit makes the cost of any but the very highest class article so high as seriously to interfere with trade. For this reason, manufacturers have adopted a new spirit, viz., Iso-propyl Alcohol. This when purified, while not admissible for delicate handkerchief perfumes, may be used in place of Rectified Spirit (Ethyl Alcohol) in the preparation of brilliantine and other hair preparations. Iso-propyl Alcohol is less than half the cost of Rectified Spirit, and may be used in the following formulas with safety.

Where a still cheaper article is required Industrial Methylated Spirit may be used. This, as its name implies, is crude Rectified Spirit which has been denatured by the addition of Wood Spirit.

Industrial Methylated Spirit can only be used in formulas authorised by the Board of H.M. Customs and Excise, and then only by persons who obtain special sanction.

Industrial Methylated Spirit must not be confused with the coloured so-called Methylated Spirit of commerce. This, properly speaking, is Mineralised Spirit, and apart from the colour is totally unfit for use in any toilet preparation.

Solubility of Essential Oils in Rectified or Industrial Spirit.—Essential or Volatile Oils, like Rose, Lavender, Bergamot, &c., and odorous bodies like Heliotropin, Coumarin, Musk, Vanillin, &c., dissolve freely in Rectified Spirit, but are thrown out by the addition of much water. If water is added to reduce the Alcohol to 70 per cent., Volatile Oils generally dissolve with difficulty and are liable to be thrown out of solution during cold weather. The same remarks apply to fixing substances like Civet, Benzoin, Storax, &c.

Ageing of Perfumes.—When a spirituous preparation tion or perfume containing essential oils or other odorous material is first made, the odour is frequently crude and unpleasant, but if the mixture is kept for some time

a marked improvement is noticed. This result, due to the ageing of blended odorous principles, is difficult to explain, but may be compared with the ageing and improvement of wines and spirits like brandy and whisky. The preparations should be stored in well-stoppered vessels in a cool place in the dark.

TOILET PREPARATIONS

Brilliantines (Separable)

1. Atoleine . . . . 5 fl. oz.
   Olive Oil . . . . 5 ,,

Mix. Stand for twenty-four hours and filter bright if necessary. Add the following mixture—

Essence of Eau de Cologne	1 fl. dr.
Absolute Alcohol	2 fl. oz.
Rectified Spirit	8 ,,

This is a very good formula, as it not only separates cleanly, but, just at the moment separation takes place, the contents assume the form of glistening beads, which slowly coalesce to perfectly transparent layers of equal tint.

2. Atoleine,
   Almond Oil . of each 10 fl. oz.
   Concentrated Essence of
   White Lilac . . . 1 fl. oz.
   Rectified Spirit . . . 10 fl. oz.

3. Atoleine . . . 10 fl. oz.
   Almond Oil . . . 6 ,,
   Chlorophyll Paste . . a trace
   Concentrated Essence of
   Violet . . . . 1 fl. dr.
   Rectified Spirit . . 10 fl. oz.

Brilliantine (Non-Separable)

Castor Oil	10 fl. oz.
Rectified Spirit	30 ,,
Concentrated Essence of Lily of the Valley	2 fl. dr.
Tincture of Turmeric (1 in 5)	a sufficiency

Camphor Ice

1. Spermaceti . . . 4 oz.
   White Wax . . . 8 ,,
   Almond Oil . . . 16 ,,

Melt, and add—

Camphor	4 oz.
Essential Oil of Almond	10 min.
Expressed Oil of Mace	2 dr.

2. Liquid Paraffin . . . 1 oz.
Hard Paraffin . . . 2½ ,,
Soft White Paraffin . . 4 ,,
Alkanet Root . . . ½ ,,

Digest on water bath for thirty minutes; strain through flannel. Add, whilst hot—

Camphor . . . . 1 oz.

When dissolved, add by degrees, constantly stirring meanwhile—

Glycerin . . . . 1 oz. by weight

Stir until nearly cool.

3. Hard Paraffin . . . 6 oz.
Soft White Paraffin . . 8½ ,,
Camphor . . . . 1½ ,,

4. Camphor . . . . 3¾ oz.
White Wax . . . 5¼ ,,
Castor Oil . . . 8½ ,,
Spermaceti . . . 17 ,,
Carbolic Acid . . . ½ dr.
Essential Oil of Almond . 15 gr.
Benzoic Acid . . . 2 dr.

Camphor Ball

1. Spermaceti . . . 4 oz.
White Wax . . . 12 ,,
Almond Oil . . . 5 ,,
Camphor . . . . 4 ,,

2. White Wax . . . 2 oz.
Almond Oil . . . 10 ,,
Spermaceti . . . 8 ,,
Camphor . . . . 6 ,,
Oil of Lavender . . 1 dr.
Oil of Clove . . . ½ ,,

3. White Wax . . . 7 oz.
Spermaceti . . . 7 ,,
Almond Oil . . . 8 ,,
Benzoated Lard . . . 7 ,,
Camphor . . . . 7 ,,

Menthol and Camphor Cake

Camphor . . . . 1 oz.
Spermaceti . . . 1½ ,,
White Wax . . . . 3 ,,
Almond Oil . . . 4 ,,
Menthol . . . . 1 dr.

Cold Cream

1. A.	White Wax	1 lb.
	Liquid Paraffin	2 pints
	Almond Oil	1 pint
B.	Borax	1 oz.
	Water	1 pint

Add B. very slowly to A. (melted and hot), and continue trituration until cold. Add—

Otto of Rose	20 min.
Oil of Bergamot	2 fl. dr.
Oil of Lemon	15 min.

2. White Wax	3 oz.
Spermaceti	2½ ,,
Almond Oil	15 ,,

Melt together, transfer to a warm mortar, and add by degrees—

Water	10 fl. oz.
Borax	2 dr.

Continue beating until practically cold ; then add—

Otto of Rose	15 drops
Oil of Neroli	5 ,,

Stir occasionally during the next few hours.

This formula is about the right consistency for winter use. In summer stiffen by addition of ¼ oz. Spermaceti and ¼ oz. White Wax.

Lanolin Cold Cream

3. White Wax	3½ oz.
Spermaceti	2½ ,,
Almond Oil	16 fl. oz.
Anhydrous Wool-fat	1 oz.

Melt together, transfer to a warm mortar, and add by degrees—

Distilled Water	10 fl. oz.
Borax	2 dr.

Continue beating until perfectly cold. Add—

Concentrated Essence of White Lilac	40 min.

NOTES.—(*a*) By substituting Vaseline for the Wool-fat in Formula 3, ' Vaseline Cold Cream ' results.

(*b*) Any of the foregoing may be tinted with Chlorophyll Paste, Solution of Cochineal, Methyl Violet, or Burnt Sugar.

(*c*) Use judgment in selecting perfumes and names. The former should be delicate. The preparations used and sold by the 'beauty specialists' do not possess strong odours; Rose-Geranium, Bergamot, &c., are absolutely tabooed.

(*d*) Cold cream and other skin creams should be applied immediately the skin is dried after ablution. Afterwards powder well with Starch, and rub. Finally wipe off superfluous powder. This removes excess of grease.

Theatrical Cold Cream

4. Spermaceti	2	oz.
White Wax	6	,,
Liquid Paraffin	32	fl. oz.
Borax	½	oz.
Water	16	fl. oz.
Oil of Rose-Geranium	4	fl. dr.

American Cold Cream

5. White Wax	4	oz.
Hard Paraffin	1	,,
Soft White Paraffin	1	,,
Liquid Paraffin	16	fl. oz.
Borax	¼	oz.
Water	10	fl. oz.
Oil of Rose-Geranium	2	fl. dr.

Soothing Creams

To be rubbed on the face after shaving. After two or three minutes, powder well with Starch Powder, and wipe off excess. This should leave the skin smooth, supple and grease free.

Medical men are agreed that it is a mistake to apply Alum and other powerful astringents to the skin after being irritated and perhaps scarified by shaving. On the contrary, emollients are indicated, especially in cold weather.

1. Hydrous Wool-fat	½	oz.
Cold Cream	2	,,
Eau de Cologne	2	fl. dr.
Menthol	10	gr.

2. Cold Cream	2	oz.
Hydrous Wool-fat	½	,,
Soft White Paraffin	½	,,
Tincture of Benzoin	2	fl. dr.
Oil of Neroli	3	drops

3. Cold Cream . . . 1 oz.
Boric Ointment . . 1 ,,
Oil of Ylang Ylang . . 1 drop

Tint *very faintly* with Chlorophyll.

4. Cold Cream . . . 1 oz.
Zinc Ointment . . . 1 ,,
Glycerin of Lead Acetate . 1 fl. dr.
Hydrous Wool-fat . . 2 dr.
Ionone . . . 2 drops
Essence of Orris . . 1 fl. dr.

Tint *very faintly* with Methyl Violet.

Emollient Cream

Bismuth Oxychloride . . 1 oz.
Liquefied Carbolic Acid . 1 fl. dr.
Almond Oil . . . 2 fl. oz.
Otto of Rose . . . 20 min.
Zincolloid Ointment . to 1 lb.

Antiseptic Cream

1. Carbolic Acid . . . 10 gr.
Camphor . . . 10 ,,
Anhydrous Wool-fat . . 4 dr.
Soft Paraffin . . . 12 ,,
Oil of Theobroma . . 2 ,,

Melt the Theobroma and Lanolin, and when cooling, but still transparent, add the Camphor and Carbolic Acid which have been previously liquefied by rubbing together.

2. Oil of Theobroma . . 4 dr.
Soft White Paraffin . . 8 ,,
Benzoated Lard . . . 4 ,,
Anhydrous Wool-fat . . 1 ,,

Melt together, and add by degrees, constantly stirring—

Strong Solution of Lead . 1 fl. dr.
Solution of Coal Tar . . 5 min.

This is a very soothing application, and keeps well.

Lanolin Cream

White Wax . . . 30 gr.
Anhydrous Wool-fat . . ½ oz.
Soft White Paraffin . . 1 ,,
Prepared Lard . . . 1 ,,
Oil of Ylang Ylang . . 5 drops

Melt together.

Cocoa Butter Cream

Soft White Paraffin	1 oz.
Oil of Theobroma	1 dr.
Starch Powder	4 ,,

Melt the Paraffin and Theobroma, and add the Starch; stir until nearly cool, and add—

Oil of Lemon	1 drop
Oil of Neroli	2 drops

This is a favourite preparation, as it does not leave the skin greasy.

Borax and Glycerin Cream

White Wax	1 oz.
Almond Oil	2½ ,,
Wool Fat	¼ ,,

Melt, and beat in the following mixture by degrees—

Glycerin of Borax	2 fl. dr.
Rose Water	1 fl. oz.
Otto of Rose	2 drops

Camphorated Menthol Cream

White Wax	1 oz.
Almond Oil	2½ ,,

Melt, and add—

Menthol	10 gr.
Camphor	10 ,,

When melted, add by degrees—

Borax	5 gr.
Rose Water	1 fl. oz.

Beat well until cold.

Benzoated Almond Cream

White Wax	1 oz.
Almond Oil	2½ ,,
Siam Benzoin	15 gr.

Digest for an hour, and strain; add by degrees, constantly beating the while—

Glycerin	1 fl. dr.
Elder Flower Water	1 fl. oz.
Borax	5 gr.
Essence of Jasmin	1 fl. dr.
Coumarin	1 gr.

Elder Flower Cream

White Wax	1 oz.
Almond Oil	2 ,,

Melt, and add—

Jasmin Pomade	½ oz.

When melted, add by degrees—

Elder Flower Water	1 fl. oz.
Borax	5 gr.
Oil of Ylang Ylang	½ drop

Beat until cold.

Tuberose Cream

Almond Oil	6 fl. oz.
White Wax	5 oz.
Spermaceti	1 ,,
Lanolin	1 ,,

Melt together, and add—

Tuberose Pomade	2 oz.
Oil of Ylang Ylang	5 min.

Finally whip in the following solution :

Citric Acid	2 dr.
Distilled Water	6 fl. dr.

Non-Greasy Toilet Cream

Quince Seed	70 gr.
Borax	35 ,,
Boric Acid	35 ,,
Glycerin	1½ fl. oz.
Rectified Spirit	2 ,,
Otto of Rose	8 min.
Boiling Water	16 fl. oz.

Digest the Quince Seed in 8 oz. of boiling water for two hours, stirring frequently ; strain through felt. Dissolve the rest of the ingredients in 8 fl. oz. of water, and mix the two very carefully, stirring well after each addition.

Cucumber Pomade

Veal Suet	10 oz.
Prepared Lard	16 ,,
Almond Oil	2 fl. oz.

Melt together, and add when cooling—

Essence of Cucumber	1 fl. oz.
Otto of Rose	2 drops

This does not keep well, so should be made just before use, but it is a very good formula for the manufacture of Cucumber Lotion, as it emulsifies well with Soap.

Vanishing Cream

Stearic Acid	2 oz.
Glycerin	2 fl. dr.
Sodium Carbonate	3 dr.
Water	10 fl. oz.

Melt the Stearic Acid, and add to the hot solution of Sodium Carbonate and Glycerin. Keep on a water bath for one hour, stirring frequently. Add a little water from time to time to make up the loss by evaporation. Transfer to a warm mortar and add gradually—

Solution of Witch Hazel	4 fl. oz.
Otto of Rose	30 min.
Extract of Violet, No. 500	30 ,,
Rose Water	to 1¼ lb.

Stir until thoroughly mixed.

Massage Creams

1. Anhydrous Wool-fat . . 2 oz.
   Prepared Lard . . . 1 ,,

Melt together, and add, with constant beating, the following mixture :

Glycerin	6 fl. dr.
Borax	30 gr.
Rose Water	2 fl. dr.
Tincture of Benzoin	1 ,,
Essence of Trefle (Concentrated 500)	2 ,,

2. Soft White Paraffin . . 1 oz.
   Lanolin . . . ½ ,,
   Powdered Castile Soap . 1 dr.

Melt together, mix, and add—

Rose Water	½ fl. oz.

Mix and add—

Otto of Rose	2 drops

Wrinkle Remover

Prepared Lard	4 oz.
Lanolin	1 ,,
Warm Water	1 fl. oz.

Melt the fats together, strain into a warm mortar, and gradually incorporate the water, stirring constantly. Lastly add—

Otto of Rose	4 drops
Rectified Spirit	30 min.

This preparation should be rubbed into the skin vigorously, as massage is a most important factor in the removal of wrinkles.

Paraffin Rouge

Hard Paraffin	1 oz.
Soft Paraffin	1½ ,,
Eosin, in Powder	1 dr.
Essential Oil of Almond	5 drops

Melt the Paraffins on a water bath and digest with the Eosin for thirty minutes, stirring occasionally; filter through paper (hot funnel necessary) to remove excess of dye. When nearly cool add the essential oil.

Directions.—Apply with finger tip, gently rubbing until desired tint is produced. Allow to remain a few minutes, then dust with starch, and remove surplus grease with a cloth.

This dyes the skin, and is not affected by perspiration.

Pomade Hongroise (Moustache Fixative)

1.

Yellow Beeswax	3 oz.
Distilled Water	6 fl. oz.
Powdered Acacia, Powdered Castile Soap, each	1½ oz.
Glycerin	2 fl. dr.

Dissolve the Soap in the water by heat, add the Gum (making up the loss by evaporation) and Glycerin. Gradually add the melted Wax, stirring constantly, but not beating. When somewhat cool, add—

Oil of Ylang Ylang	12 min.
Oil of Clove	2 ,,
Essence of Eau de Cologne	8 ,,
Benzoic Acid	2 gr.

If a coloured pomade is desired, add Powdered Sienna or Drop Black to the soapy liquid.

2.

Gum Acacia, in powder	5 oz.
White Beeswax	5 ,,
Yellow Beeswax	5 ,,
White Castile Soap	5 ,,
Oil of Bergamot	1 fl. oz.
Glycerin	2½ fl. oz.
Oil of Lavender	1½ dr.
Oil of Rose Geranium	3 ,,
Water	1 pint

Cosmetics

1. Hard Paraffin . . . 1 oz.
   Soft Paraffin . . . 2 ,,
   Prepared Suet (fresh) . . 1 ,,
   Oil of Ylang Ylang . . 4 drops
   Oil of Clove . . . 1 drop
   Oil of Neroli . . . 2 drops

2. White Wax . . . 2 oz.
   Beef Suet . . . . 4 ,,
   Oil of Bergamot . . . 8 drops
   Oil of Neroli . . . 2 ,,

3. Prepared Lard . . . 4 oz.
   White Wax . . . 1½ ,,
   Hard Paraffin . . . ½ ,,
   Coumarin . . . . 1 gr.
   Vanillin . . . . ½ ,,
   Oil of Clove . . . 2 drops

4. White Wax . . . 4 oz.
   Jasmin Pomade . . . 4 ,,
   Prepared Lard . . . 4 ,,
   Prepared Suet . . . 8 ,,
   Ionone . . . 5 drops
   Otto of Rose . . . 5 ,,
   Oil of Clove . . . 2 ,,

5. To make Lily of the Valley, White Rose, Violet, or other high-class ' floral ' cosmetic, take—

   Hard Paraffin . . . 1 oz.
   Soft Paraffin . . . 2 ,,
   Prepared Suet (fresh) . ½ ,,
   Oil of Theobroma . . ½ ,,

Melt together, and when nearly cool add 20 drops Concentrated Essence (500) of the required perfume, and cast into sticks.

Colours for Cosmetics

Brown.—Very finely powdered Raw or Burnt Sienna, Brown Umber, &c.

Black.—Drop Black.

Face and Skin Lotions

Skin Tightener to remove Wrinkles

1. Alum . . . . 10 gr.
   Zinc Sulphate . . . 5 ,,
   Glycerin . . . . 1 fl. dr.
   Tincture of Benzoin . . 1 ,,
   Essence of Eau de Cologne . 30 min.
   Distilled Water . . to 1 pint

Dissolve the salts in a little water. Mix the Glycerin with the bulk of the water, and pour in the mixed Essence and Tincture. Mix the liquids. The result should be a non-separable milky lotion.

2.
Alum	2 dr.
Saponin	5 gr.
Simple Tincture of Benzoin	2 fl. dr.
Oil of Ylang Ylang	2 drops
Orange Flower Water	5 fl. oz.
Rose Water	to 1 pint

3.
Zinc Sulphocarbolate	20 gr.
Zinc Oxide	6 dr.
Glycerin	2 fl. dr.
Rose Water	5 fl. oz.
Elder Flower Water	to 1 pint

4.
Mercuric Chloride	4 gr.
Glycerin	2 fl. dr.
Oil of Ylang Ylang	1 drop
Elder Flower Water	to 1 pint

Filter bright through Kieselguhr, and tint with Methyl Violet.

(Mercuric Chloride is on the Poison Schedule.)

Soothing Lotion for Sunburn, &c.

Borax, Boric Acid	of each 15 gr.
Glycerin	1 fl. dr.
Cherry Laurel Water	1 fl. oz.
Essence of Musk	20 min.
Essence of Jasmin	4 fl. dr.
Essence of Tuberose	2 ,,
Distilled Water	to 1 pint

Mix as directed for No. 1.

Startin's Calamine Lotion

Calamine	1 oz.
Zinc Oxide	1 ,,
Glycerin	2 fl. dr.
Cherry Laurel Water	1 fl. oz.
Elder Flower Water	to 1 pint

Milk of Roses

1. Blanched Almonds . . 2 oz.
   Castile Soap (blanched) . 2 dr.

Beat the almonds to a paste and add the Castile Soap. When smooth, add, previously melted together—

Spermaceti . . . 60 gr.
White Wax . . . 120 ,,
Almond Oil . . . 2 fl. dr.

When incorporated, dilute with water to 19 fl. oz., and add—

Essence of Rose . . . 1 fl. oz.

2. Borax . . . . 1 dr.
   Powdered Castile Soap . 4 ,,
   Cold Cream . . . 1 oz.
   Otto of Rose . . . 6 drops

Mix thoroughly and add by degrees, constantly triturating—

Rose Water to . . . . 18 fl. oz.

Finally add—

Rectified Spirit . . . 2 fl. oz.

3. Blanched Almonds . . 8 oz.
   Rose Water . . . 3 pints

Make a lotion, and strain. Melt together—

Almond Oil . . . 1 fl. oz.
White Wax . . . ½ oz.

Place in a hot mortar, and add—

Powdered Castile Soap . ½ oz.

Mix, and add the Almond lotion by degrees. Strain, and add—

Essence of Eau de Cologne . 4 fl. dr.
Otto of Rose . . . 10 min.

Elder Flower Milk

Bitter Almonds . . . 1½ oz.
Borax . . . . 30 gr.
Glycerin . . . . 2 fl. dr.
Elder Flower Water . to 1 pint
Oil of Ylang Ylang . . 5 drops

Blanch the Almonds, and rub them through a thirty-hole sieve. Beat to a smooth paste with a few drachms of the water. Gradually dilute with the remainder, in which the Glycerin and Borax have been dissolved.

Glycerin and Cucumber Lotion

Beef Suet	2 dr.
Prepared Lard	4 ,,
Powdered Curd Soap	3 ,,
Powdered Borax	1 ,,

Mix, and dilute gradually with—

Distilled Water	18 fl. oz.

Strain through muslin, and add—

Glycerin	6 fl. dr.
Rectified Spirit	½ fl. oz.
Otto of Rose	5 drops
Oil of Ylang Ylang	1 drop
Essence of Cucumber	4 fl. dr.

Cucumber and Lily Cream

Cucumber Pomade	1 oz.
Borax	¼ ,,
Powdered Castile Soap	3 dr.

Mix, and dilute gradually with—

Distilled Water	10 fl. oz.

Strain through muslin, and add—

Cherry Laurel Water	1 fl. oz.
Concentrated Essence of Lily of the Valley (500)	15 min.
Glycerin	6 fl. dr.
Rose Water	to 1 pint

Rose Cream

Jasmin Pomade	1 oz.
Borax	3 dr.
Powdered Castile Soap	3 ,,

Mix, and dilute gradually with—

Elder Flower Water	10 fl. oz.

Strain through muslin, and add—

Rectified Spirit	2 fl. oz.
Glycerin	6 fl. dr.
Otto of Rose and Oil of Ylang Ylang of each	3 drops
Solution of Carmine sufficient to give a very faint rose tint.	
Orange Flower Water	to 1 pint

Creme de Niel

Jasmin Pomade	1 oz.
Powdered Castile Soap	3 dr.
Powdered Borax	3 ,,

Mix, and dilute gradually with—

Orange Flower Water	10 fl. oz.
Glycerin	½ ,,
Chlorophyll Paste sufficient to give a very faint greenish tinge.	
Essence of Wood Violet	2 fl. oz.
Rose Water	to 1 pint

NOTE.—The last three preparations are somewhat expensive, but they yield beautiful lotions, which are well patronised by the fair sex. The public is a little tired of the rose-geranium type of lotion.

Glycerin Milk

Glycerin	4 fl. oz.
Rose Water, Elder Flower Water, Orange Flower Water of each	5 ,,

Mix, and pour in the following in a thin stream—

Eau de Cologne	6 fl. dr.
Tincture of Benzoin	2 ,,
Saponin	1 gr.
Solution of Cochineal	a faint trace

This is a far superior preparation to the ordinary 'Glycerin and Rose Water,' and makes a good speciality. Add the Cochineal last.

Cucumber and Lanolin Milk

Hydrous Wool-fat	4 dr.
Prepared Lard	4 ,,
Borax	3 ,,
Powdered Castile Soap	3 ,,

Mix in a warm mortar, and add by degrees—

Rose Water	10 fl. oz.

Strain through muslin, and add—

Essence of Cucumber	4 fl. dr.
Eau de Cologne	2 fl. oz.
Glycerin	6 fl. dr.
Elder Flower Water	to 1 pint

It has been stated that lotions of the 'Cucumber' type cannot be made with Lanolin, but this is easy to manipulate and keeps well.

Lotions for removing Freckles and preventing Freckling

1. Ammonium Chloride . . 2 dr.
   Zinc Sulphocarbolate . . 20 gr.
   Glycerin . . . . 2 fl. dr.
   Orange Flower Water . . 5 fl. oz.
   Elder Flower Water . to 1 pint

2. Mercuric Chloride . . 5 gr.
   Glycerin . . . . 2 fl. dr.
   Rectified Spirit . . . 2 fl. oz.
   Rose Water . . to 1 pint

NOTE.—Mercuric Chloride is on the Poison Shedule.

3. Ammonium Chloride . . 30 gr.
   Glycerin . . . . 4 fl. dr.
   Eau de Cologne . . 2 fl. oz.
   Tincture of Benzoin . . 2 fl. dr.
   Saponin . . . . 2 gr.
   Distilled Water . . to 1 pint

Mix the Eau de Cologne and Tincture of Benzoin, and pour into the water in which the other ingredients have been dissolved.

4. Boric Acid . . . 30 gr.
   Cherry Laurel Water . . 2 fl. oz.
   Glycerin . . . . 2 fl. dr.
   Rose Water . . . 10 fl. oz.
   Elder Flower Water . to 1 pint

5. Lactic Acid . . . 1 fl. dr.
   Glycerin . . . . 2 ,,
   Boric Acid . . . 15 ,,
   Tincture of Orris . . 1 fl. oz.
   Tincture of Benzoin . . 2 fl. dr.
   Elder Flower Water . to 1 pint

Mix the Tinctures and pour them into the Elder Flower Water, in which the other ingredients have been dissolved.

Skin Tonic

Rose Water . . . 9 fl. oz.
Elder Flower Water . . 9 ,,
Eau de Cologne . . 1 ,,
Lavender Water . . 1 ,,

Mix, and filter bright.

Lait Virginal

Rose Water,
Elder Flower Water,
Orange Flower Water of each 5 fl. oz.

Mix, and pour into the mixture—

Simple Tincture of Siam Benzoin . . . . 3 fl. dr.

If the milk-like lotion shows a tendency to separate on keeping, add 2 grains of Saponin.

Sulphur Skin Lotion

Precipitated Sulphur	2 dr.
Zinc Sulphocarbolate	30 gr.
Glycerin	2 fl. dr.
Eau de Cologne	1 fl. oz.
Soft Soap	10 gr.
Elder Flower Water, Rose Water of each	4 fl. oz.

The trace of Soap enables the Sulphur to be diffused equally throughout the liquid.

Camphor Milk

Alcoholic Solution of Ammonia	5 fl. parts
Oleic Acid	10 ,,
Liquid Paraffin	20 ,,
Camphor	1 part
Menthol	1 ,,

Dissolve the Camphor, Menthol and Oleic Acid in the Liquid Paraffin; add the Ammonia, and shake. Finally add, in small quantities at a time, shaking well after each addition—

Distilled Water . . . sufficient to produce 150 fl. parts

Lanolin Milk

Anhydrous Lanolin	1 oz.
Powdered Castile Soap	½ ,,

Warm gently, mix, and add—

Warm Distilled Water . 1 fl. oz.

Make a strong primary emulsion, and dilute. Add—

Glycerin	2 fl. dr.
Oil of Rose	5 min.
Distilled Water to	8 fl. oz.

Elder Flower Ointment

Freshly gathered Flowers, *free from stalks*	1 lb.
Suet	½ ,,
Prepared Lard	6 ,,

Melt, add the flowers, and heat to a temperature of about 140° F. for three hours. Strain, press, and filter through hot funnel.

Enamels for the Face

The following very closely resembles the best known of the so-called *French Enamels*. So far as the writer knows, this is the first time the formula has been published :

Freshly precipitated moist Zinc Carbonate (containing about 20 per cent.)	1 oz.
Glycerin	10 min.
Concentrated Essence of Trefle Blanc	4 ,,

This, when spread on the skin, leaves a semi-transparent film or enamel. It is infinitely superior to the ordinary Zinc Oxide or Calamine lotions.

The following are the perfumes used :

Concentrated Lilac Essence	4 min. to each ounce
Concentrated Violet Essence	4 min. to each ounce.
Concentrated White Rose Essence	4 min. to each ounce
Concentrated Chypre Essence	4 min. to each ounce

NOTE.—The very finest Face Lotions are made with Colloidal Zinc Oxide and Calamine.

Theatrical Wet White

1. Zinc Carbonate	4 oz.
Bismuth Oxychloride	2 ,,
Glycerin	1½ fl. oz.
White Rose Essence, '500'	1 fl. dr.
Orange Flower Water	to 1 pint
2. Zinc Oxide	4 oz.
Prepared Talc	3 ,,
Magnesium Carbonate, light	1 ,,
Glycerin	2 fl. oz.
Violet Essence, '500'	30 min.
Rose Water	to 1 pint

Face Powders, Violet Powders, &c.

The finished powders should be put through a 120*-hole sieve* twice. *The pigments and perfumes should be*

moistened with spirit and thoroughly triturated with a portion of the diluent, so as to ensure even distribution.

Face Powders

1. *Flesh Tint :*

Bole	25 gr.
Yellow Ochre	120 ,,
Burnt Umber	2 ,,
Colloidal Kaolin	1 lb.
Oil of Neroli	16 drops

2. *Cream :*

Bole	10 gr.
Yellow Ochre	150 ,,
Colloidal Kaolin	1 lb.
Oil of Ylang Ylang	16 drops

3. *Flesh :*

Bole	15 gr.
Carmine	2 ,,
Yellow Ochre	120 ,,
Burnt Umber	3 ,,
Colloidal Kaolin	12 ,,
Concentrated Essence of Wood Violet	40 min.

4. Bismuth Oxychloride 1 oz.
French Chalk 4 ,,
Maize Starch 11 ,,
Coumarin 2 gr.
Hyacinthin 1 ,,
Oil of Ylang Ylang 5 min.

5. French Chalk 3 oz.
Zinc Oxide 1 ,,
Maize Starch 12 ,,
Coumarin 1 gr.
Vanillin 1 ,,
Essence of Musk 1 fl. dr.
Ionone 10 min.

6. Colloidal Kaolin 10 oz.
Powdered French Chalk 5 ,,
Bismuth Oxychloride 1 ,,
Carmine 1 gr.
Rectified Spirit enough to distribute the colour
Concentrated Essence of White Rose 20 min.

7. Calamine (Colloidal) $1\frac{1}{2}$ oz.
Powdered Boric Acid $1\frac{1}{2}$,,
Maize Starch 13 ,,

8. Bole . . . . 16 gr.
Ochre . . . 120 ,,
Umber . . . . 1 ,,
Concentrated Wood Violet . 60 min.
Maize Starch . . . 8 oz.
Zinc Oxide . . . 4 ,,
French Chalk . . . 4 ,,

Solid Face Powder

1. Prepared Talc . . . 1 lb.
Orris Root, powder . . 1 oz.
Otto of Rose . . . 30 min.
Starch Mucilage . . a sufficiency

Make into a smooth paste, mould into tablets of the required size and shape and dry.

2. Prepared Talc . . . 8 oz.
Prepared Chalk . . . 1 ,,
Colloidal Kaolin . . 7 oz.
Carmine . . . . 2 gr.
Carnation Essence . . 30 min.
Starch Mucilage . . . a sufficiency

Violet Powders

1. Powdered Starch . . 15 oz.
Powdered Orris . . . 1 ,,
Oil of Musk . . . 10 min.
Oil of Bergamot . . 15 ,,

2. Powdered Starch . . 14 oz.
Kaolin . . . . 1½ ,,
Orris Powder . . . ½ ,,
Otto of Rose . . . 6 min.
Oil of Clove . . . 1 ,,

3. Powdered Starch . . 14 oz.
Bismuth Oxychloride . ½ ,,
Orris Powder . . . ½ ,,
Ionone . . . . 5 min.
Coumarin . . . . ½ gr.

4. Powdered Starch . . 14 oz.
Powdered Orris . . . ½ ,,
Powdered Boric Acid . . 1½ ,,
Oil of Bergamot . . 8 min.
Oil of Lemon . . . 2 ,,

5. Powdered Starch . . 13 oz.
Powdered Boric Acid . . 2 ,,
Zinc Oxide . . . 1 ,,
Oil of Ylang Ylang . . 4 min.
Otto of Rose . . . 1 ,,

6. Powdered Starch . . 12 oz.
   Kaolin . . . . 2 ,,
   Zinc Oxide . . . 1 ,,
   Otto of Rose . . . 5 min.
   Terpineol . . . . 1 ,,

7. Powdered Starch . . 10 oz.
   French Chalk . . . 4 ,,
   Boric Acid . . . 2 ,,
   Essence of Eau de Cologne . 30 min.

Nursery Toilet Powder

Maize Starch . . . 1 lb.
Kaolin . . . . 1 ,,
Boric Acid . . . 4 oz.
Zinc Oxide . . . 4 ,,
French Chalk . . . 1 lb.
Oil of Lemon,
Oil of Lavender,
Terpineol . of each 20 min.

Glycerin Jellies, &c.

1. Colourless Gelatin, in sheets . 5 dr.
   Rose Water,
   Elder Flower Water,
   Orange Flower Water of each 4 fl. oz.

Filter the waters bright through Kieselguhr, add to the Gelatin ; when softened, transfer to a jar containing—

Glycerin at 60° C. . . 8 fl. oz.

Stir gently so as to avoid formation of bubbles, and strain through muslin.

This formula may be varied by tinting

Violet with Methyl Violet.
Amber with Burnt Sugar.
Green with Chlorophyll.
Yellow with Saffron.

2. Arrowroot . . . . 9 oz.
   Distilled Water . . . 1 fl. oz.
   Glycerin . . . . 70 ,,
   Oil of Ylang Ylang . . 2 fl. dr.

3. Gelatin . . . . 1 oz.
   Rose Water . . . 10 fl. oz.
   Glycerin . . . . 30 ,,
   Citric Acid . . . 60 gr.
   Otto of Rose . . . 5 min.

4. Flake Tragacanth . . ½ oz.
   Distilled Water . . . 5 fl. oz.
   Glycerin . . . . 5 ,,
   Otto of Rose . . . 10 drops

5. Transparent Soap (in shavings) . . . . 1 oz.
Distilled Water . . . 4 fl. oz.
Glycerin . . . . . 4 ,,

Dissolve by aid of gentle heat. While still warm, add—

Oil of Neroli . . . 20 min.
Otto of Rose . . . 10 ,,
Coumarin . . . . 1 gr.
Absolute Alcohol . . 1 fl. dr.

6. Boric Acid . . . 1½ dr.
Gelatin . . . . ½ oz.
Rose Water . . . 8 fl. oz.
Glycerin . . . . 8 ,,
Otto of Rose . . . 5 min.
Raspberry Colouring 45612 . to tint

Glycerin and Honey Jelly

Boric Acid . . . ¼ oz.
Gelatin . . . . 1½ ,,
Glycerin . . . . 36 fl. oz.
Honey, Clarified . . 6 oz.
Solution of Witch Hazel . 2 fl. oz.
Rose Water, undiluted . 36 ,,
Lemon Yellow Colouring 19943 . . . . to tint

HAIR PREPARATIONS

Bay Rum

1. Oil of Bay Leaf . . . 6 fl. dr.
Oil of Bergamot . . . 15 min.
Oil of Orange . . . 30 ,,
Oil of Rosemary . . 10 ,,
Rectified Spirit . . . 4 pints
Rose Water . . to 1 gal.

Stand for seven days, and filter bright through Kieselguhr.

2. Oil of Bay Leaf . . . 1 fl. oz.
Oil of Pimento . . . 40 min.
Oil of Orange Peel . 40 ,,
Rectified Spirit . . 6 pints
Distilled Water . . to 1 gal.

3. Oil of Bay Leaf . . . 6 fl. dr.
Lemon Peel,
Orange Peel,
Clove . . of each 1 oz.
Cardamoms . . . ½ oz.
Acetic Ether . . . 20 min.
Oil of Rosemary . . 10 ,,
Rectified Spirit . . . 4 pints

Macerate for seven days, add 3 quarts of water, and distil 1 gallon.

4. Oil of Bay Leaf . . . 30 min.
Oil of Pimento . . . 10 ,,
Oil of Clove . . . 5 ,,
Rectified Spirit . . . 2 pints
Rum . . . . ½ pint
Distilled Water . . . 1½ pints
Solution of Ammonia . 1 fl. dr.

Bay Rum and Cantharides

1. Tincture of Cantharides . 1 fl. oz.
Bay Rum . . . to 1 pint

2. Cantharidin . . . 1 gr.
Chloroform . . . 30 min.
Bay Rum . . . to 1 pint

Bay Rum Tonics or Hair Lotions

1. Bay Rum . . . . 10 fl. oz.
Tincture of Cantharides . 2 ,,
Solution of Ammonia, ·880 . 2 fl. dr.
Glycerin . . . . 1 ,,
Water . . . to 1 pint

Mix. Stand seven days and filter through Kieselguhr.

2. Bay Rum . . . . 10 fl. oz.
Borax . . . . 2 dr.
Tincture of Cantharides . 2 fl. oz.
β-Naphthol . . . 30 gr.
Salicylic Acid . . . 15 ,,
Rose Water . . to 1 pint

An excellent preparation for scurf, &c.

Bay Rum Shampoo

1. Soft Soap . . . . 1 oz.
Bay Rum . . . . 5 fl. oz.

Dissolve by very gentle heat, and add—

Solution of Ammonia, ·880 . 2 fl. dr.
Water . . . to 1 pint

2. Brown Windsor Soap . . 1 oz.
   Water . . . . 15 fl. oz.

Dissolve by gentle heat, and add—

Bay Rum . . . to 1 pint

Stand for seven days and filter.

Bay Rum Dry Shampoo

Quillaia Bark . . 8 oz.
Distilled Water . . . 2 pints

Make a decoction, boiling gently until strained product measures 1 pint. Add—

Bay Rum . . . . ½ pint
Acetic Ether . . . ½ fl. dr.

Liquid Cocoanut Oil Shampoo

Cocoanut Oil . . . 3 lb. 2 oz.
Potassium Hydroxide . . 14 oz.
Potassium Carbonate . . 1 ,,
Glycerin . . . . 5 fl. oz.
Essence of Eau de Cologne . ½ ,,
Distilled Water . . to 1½ gal.

Dissolve the Potassium Hydroxide in half a gallon of distilled water. Place in an enamelled steampan and add the Cocoanut Oil. Heat with occasional stirring until a little of the resulting soap is clearly soluble in warm water. Then add the Potassium Carbonate, Glycerin and water to produce 1½ gallons. Cool, add the Essence of Eau de Cologne, shake well, stand to deposit, and filter bright.

Depilatories

1. Freshly prepared Barium Sulphide . . . . 1 part
   Starch . . . . 1 ,,

Immediately before use, moisten with water and apply the paste to the hairy part. After ten minutes remove with a bone knife and anoint with cold cream to allay any irritation that may be caused.

2. Calcium Hydroxide . . . 1 oz.
   Water . . . . 4 fl. oz.

Make into a paste, and pass Hydrogen Sulphide through for twenty minutes. Use as above. It is equally efficacious, but more disagreeable.

Eau de Quinine

1. Quinine Hydrochloride . 40 gr.
   Rectified Spirit . . . 5 fl. oz.
   Tincture of Cudbear . . 4 fl. dr.
   Glycerin . . . . 1½ fl. oz.
   Orange Flower Water . . 6 ,,
   Rose Water . . to 1 pint

2. Quinine Hydrochloride . 40 gr.
   Tincture of Cantharides . 2 fl. dr.
   Glycerin . . . . 2 fl. oz.
   Eau de Cologne . . 2 ,,
   Rectified Spirit . . . 5 ,,
   Tincture of Cudbear . . 4 fl. dr.
   Rose Water . . to 1 pint

Shampoo Powders

1. Powdered Quillaia . . ¼ oz.
   Camphor . . . . 10 gr.
   Borax . . . . . 1 oz.
   Sodium Carbonate, *dried* . ½ ,,
   Oil of Rosemary . . 20 drops

For one packet. To be dissolved in about 1 pint of hot water.

2. Powdered Soap . . . ¼ oz.
   Dried Sodium Carbonate . 1 dr.
   Borax . . . . ½ ,,
   Oil of Rosemary . . 15 drops
   Phenolphthalein . . ½ gr.

For one packet.

Shampoo Powder with Henna

1. Cocoanut Oil Soap, powder . ¼ oz.
   Dried Sodium Carbonate . 1 dr.
   Borax . . . . ½ ,,
   Henna Leaf, powder . . ½ ,,
   Oil of Lemon . . . 10 min.
   Oil of Verbena . . . 5 ,,

For one packet.

2. Cocoanut Oil Soap, powder . ¼ oz.
   Borax . . . . ½ ,,
   Liquid Extract of Henna . 1 fl. dr.

Mix well, dry and add—

   Oil of Lavender . . . 10 min.
   Oil of Rosemary . 5 ,,

For one packet.

Dry Shampoo Powders

1. Orris Root, powder . . 2 oz.
   Kaolin . . . . 8 ,,
   Maize Starch . . . 6 ,,
   Oil of Lavender . . . 1 fl. dr.
   Oil of Verbena . . . 20 min.

Rub a little of the powder into the hair at bedtime and remove in the morning by vigorous brushing.

2. Sandal Wood, powder . 2 oz.
   Borax, powder . . . 1 oz.
   Fuller's Earth . . . 5 ,,
   Maize Starch . . . 8 ,,
   Oil of Lavender . . . ½ fl. dr.
   Oil of Rosemary . . . ½ ,,

Moustache Varnishes

1. Mastic,
   Sandarac,
   Copal . . of each ½ oz.
   Absolute Alcohol . . 10 fl. oz.
   Concentrated Essence of Lily of the Valley . . . 30 min.

2. Take exhausted Tolu Balsam, as obtained in the preparation of Tolu Syrup, and place it in a thin layer on a plate and heat in an oven or other convenient place for some hours until perfectly brittle.

   Of this dried Balsam, take . 2 oz.
   Rectified Spirit . . 10 fl. oz.

Dissolve, strain, and add—

   Concentrated Essence Trefle Blanc . . . . 30 min.

Moustache Fixative

   Powdered Acacia . . 1 oz.
   Soft Soap . . . . 1 ,,
   Water . . . . 2 fl. oz.

Dissolve by heat on a water bath ; make up to weight ; while hot, add by degrees—

   Melted White Wax . . 2 oz.

Stir until homogeneous.

If required brown, tint with Caramel or Oil-soluble Brown. Perfume with Rose or Ylang Ylang about two drops per oz.

Spirit Gum for Theatrical Use

Pale Resin, high-dried	2 oz.
Castor Oil	30 min.
Rectified Spirit *	10 fl. oz.
Oil of Bergamot	30 min.

Hair Curling Preparations

Liquid

1.

Sodium Carbonate	80 gr.
Solution of Ammonia, ·880	40 min.
Mucilage of Acacia	4 fl. dr.
Oil of Clove	1 drop
Rose Water	to 10 fl. oz.

2.

Linseed	1 oz.

Wash to remove dust, and boil for two minutes in 1 pint of distilled water. Strain, and to the hot liquid add—

Mucilage of Acacia	2 fl. oz.

Cool, and very cautiously, to avoid precipitating the gums, add—

Chloroform	10 min.
Oil of Clove	5 ,,
Oil of Neroli	8 ,,
Oil of Bergamot	10 ,,
Salicylic Acid	5 gr.
Rectified Spirit	5 fl. oz.

3.

Potassium Carbonate	1 dr.
Glycerin	1 fl. dr.
Solution of Ammonia	20 min.
Rose Water, Elder Flower Water, and Orange Flower Water, equal parts to make	8 fl. oz.

Bandolines

1.

Tragacanth	¾ oz.
Distilled Water	1 pint

Macerate for two days ; finish on water bath. Strain through muslin. When cool add—

Eau de Cologne Essence	30 min.

2.

Tragacanth	½ oz.
Distilled Water	¾ pint

* If a very cheap article is desired, the Rectified Spirit may be replaced by Acetone, or even by Methylated Spirit. If the latter, permission from the Excise should be obtained to use the industrial variety, which is devoid of mineral naphtha.

Proceed as for No. 1, and add to—

Mucilage of Starch (double strength)	5 fl. oz.
Otto of Rose	10 min.
Oil of Neroli	10 ,,

Powder

3. Dried Carbonate of Soda	3 lb.
Powdered Acacia	½ ,,
Oil of Lavender	1 dr.

Put up in 1 oz. packets. The contents of one packet to be dissolved in a quarter of a pint of hot water.

Hair Dyes

Lead and Sulphur

Lead Acetate	80 gr.
Precipitated Sulphur	80 ,,
Glycerin	4 fl. dr.
Rose Water, Orange Flower Water, of each	equal parts to 8 fl. oz.

Damp the Sulphur with Rectified Spirit and mix with the Lead and Glycerin. Dilute gradually.

Many formulas for the above type of dye or 'restorer' have been published, but one example will suffice.

Bismuth

None of the published formulas gives satisfactory results, and so far as can be ascertained no Bismuth hair stain is used by any of the leading experts.

Silver

1. (*a*) Sodium Sulphide, in transparent crystals	80 gr.
Distilled Water	to 4 fl. oz.
(*b*) Silver Nitrate	40 gr.
Solution of Ammonia, ·959	2 fl. dr.
Distilled Water	to 4 fl. oz.

Thoroughly shampoo the hair to remove grease. Dry. Brush the hair first with solution (*a*), and after five minutes with solution (*b*). Do not brush or oil the hair for about twenty-four hours afterwards.

2. (*a*) Pyrogallic Acid	40 gr.
Sodium Metabisulphite	15 ,,
Distilled Water	to 4 fl. oz.

(*b*) Silver Nitrate . . .	35 gr.
Solution of Ammonia . .	a sufficiency

Dissolve the Nitrate in 2 fl. oz. of Distilled Water and add the Ammonia until the precipitate which at first forms is redissolved. Dilute to 4 fl. oz.

Directions.—The same as for No. 1.

NOTES.—*Silver Nitrate in the proportions given in these formulas will give a black dye. If the quantity is reduced, brownish tints will result.*

No dye will act unless the hair is previously rendered grease-free.

The skin of the forehead and neck should always be protected with Paraffin Ointment, extra stiff.

Permanganate

A 5 per cent. solution of Potassium Permanganate applied to grease-free hair, after two or three applications, produces a rich chestnut colour. The hair should not be brushed or oiled for at least twenty-four hours after applying.

Henna

No preparation of Henna is of the slightest use by itself as a hair stain. The usual method of employing Henna is as follows :

Take Henna Powder, and make into a thin paste with boiling water, cool, and apply to the hair, close contact being ensured by the use of a bandage or cap. After some hours the dry powder is brushed out, and the hair brushed with dilute Ammonia Solution. While still somewhat damp the hair is brushed with a solution of Potassium Permanganate, about 2 per cent.

If properly applied, this method produces a brownish-chestnut shade.

Walnut

Green Walnut Shells, bruised	¾ lb.
Alum	1 oz.
Olive Oil	1 pint

Digest on a water bath for twenty-four hours, press, and filter.

This is not of much use.

Pyrogallic Acid

1. Cupric Chloride	2 dr.
Pyrogallic Acid . . .	1 ,,
Distilled Water . . .	6 fl. oz.

2. Pyrogallic Acid . . . ¼ oz.
   Water . . . . 8 fl. oz.

3. (*a*) Cupric Chloride . . 2200 gr.
   Distilled Water . . 11 fl. oz.
   Solution of Ammonia, ·880 . 5 ,,

   (*b*) Pyrogallic Acid . . 3000 gr.
   Hydrochloric Acid, B.P. . 22½ oz.
   Distilled Water . . . 32 fl. oz.

Add (*a*) to (*b*), stirring constantly; then add very slowly, still stirring vigorously—

Solution of Ammonia, ·959 . 6½ fl. oz.

After well mixing, stir in—

Solution of Hydrogen Peroxide (20 vol.). . . 16 fl. oz.

and make up to 1 gal. with distilled water. Keep for at least fourteen days in a wide mouth jar open to the air. Stir several times a day.

If the hair has been thoroughly cleansed from grease, this is a capital dye.

Lead

Lead Acetate . . . 5¾ gr.
Distilled Water sufficient to dissolve.

Pour into a mixture of the following—

Sodium Thiosulphate . . 11½ gr.
Glycerin . . . . 50 min.
90 per cent. Alcohol . . 100 ,,
Distilled Water . . . 800 ,,

Keep in amber bottles.

Hair Fixatives

Non-oily

Tragacanth, powder . . ½ oz.
Parma Violet Perfume . 1 fl. dr.
Otto of Rose . . . 20 min.
Rectified Spirit . . . 1 fl. oz.
Glycerin . . . . ½ fl. oz.
Water . . . to 1 pint

Mix the Tragacanth, Perfumes, Spirit and Glycerin in a dry bottle. Add the water all at once, and shake thoroughly.

Oily

Tragacanth, powder	¼ oz.
Otto of Rose	10 min.
Eau de Cologne	½ fl. oz.
Rectified Spirit	½ ,,
Mucilage of Starch	5 ,,
Violet Atoleine	1 fl. oz.
Water	to 1 pint

Mix the Tragacanth, Perfumes and Spirit in a dry bottle. Add half a pint of water all at once and shake thoroughly. Mix the Mucilage of Starch with the remaining water. Mix all together, and finally add the Violet Atoleine.

Hair Lotions

Salicylic

Salicylic Acid	30 gr.
Borax	60 ,,
Tincture of Cantharides	1 fl. oz.
Rosemary Water, Rose Water	equal parts to 10 fl. oz.

Tint yellow with strong Tincture of Turmeric, or violet with a drop of Solution of Ferric Chloride.

Useful for scurf, dandruff, &c.

Sulphurous Acid

Fresh Sulphurous Acid	2 fl. oz.
Salicylic Acid	30 gr.
Rectified Spirit	4 fl. oz.
Water	to 8 ,,

For seborrhœa. It is a certain cure, and after the scalp has once been cleaned, no fresh growth of scurf will occur if the lotion is applied once or twice a week.

NOTE.—It must be well sponged or rubbed into the roots of the hair. While it is quite harmless to the hair and scalp, it should not be used on hair which has been dyed with phenylene-diamine or similar dyes.

β-Naphthol and Resorcin

β-Naphthol	10 gr.
Quinine Hydrochloride	5 ,,
Resorcin	10 ,,
Bay Rum	5 fl. oz.
Water to	10 ,,

For seborrhœa. Apply as above.

Borax and Camphor

1. Borax . . . . 1 dr.
   Solution of Ammonia, ·880 . 2 fl. dr.
   Glycerin . . . . 1 ,,
   Oil of Ylang Ylang . . 1 drop
   Camphor Water . . to 10 fl. oz.

2. Borax . . . . 2 dr.
   Aromatic Spirit of Ammonia 4 fl. dr.
   Tincture of Cantharides . 1 fl. oz.
   Rosemary Water . . 5 ,,
   Eau de Cologne . . . ½ ,,
   Camphor Water . . to 10 ,,

Tint yellow with Turmeric, or green with Chlorophyll.

Cantharides Hair Wash

1. Vinegar of Cantharides . 2 fl. dr.
   Aromatic Vinegar . . 4 ,,
   Bay Rum . . . . 2 fl. oz.
   Glycerin . . . . 1 fl. dr.
   Water . . . to 10 fl. oz.

2. Oil of Bergamot . . 1 fl. dr.
   Tincture of Cantharides . 4 ,,
   Tincture of Capsicum . 2 fl. dr.
   Rose Water . . . 1½ fl. oz.
   Rectified Spirit . . to 6 ,,

Cantharides and Jaborandi Hair Tonic

Vinegar of Cantharides . 1 fl. oz.
Tincture of Jaborandi . 1 ,,
Glycerin . . . 1½ ,,
Eau de Cologne . . 1½ ,,
Rose Water . . to 1 pint

Cocoanut Pomade

Cocoanut Oil . . . 8 oz.
Castor Oil . . . 8 fl. oz.
Oil of Bergamot . . 30 min.
Oil of Lavender . . 1 fl. dr.

Cologne Hair Tonic

Acetic Acid . . . 1 fl. oz.
Tincture of Cantharides . 2 ,,
Glycerin . . . . 1 ,,
Eau de Cologne . to 1 pint

Jaborandi, Cantharides and Quinine Hair Wash

1.	Tincture of Jaborandi		1½ fl. oz.
	Tincture of Cantharides		1 ,,
	Tincture of Cinchona		½ ,,
	Bay Rum		5 ,,
	Rose Water	to	1 pint
2.	Tincture of Jaborandi		1½ fl. oz.
	Tincture of Cantharides		½ ,,
	Tincture of Cinchona		½ ,,
	Glycerin		1 ,,
	Acetic Acid		½ ,,
	Rose Water	to	1 pint
3.	Quinine Hydrochloride		40 gr.
	Tincture of Jaborandi		1½ fl. oz.
	Vinegar of Cantharides		½ ,,
	Glycerin		1 ,,
	Bay Rum	to	1 pint

Rosemary and Cantharides Hair Lotion

1.	Acetic Acid		1 fl. oz.
	Glycerin		1 ,,
	Vinegar of Cantharides		6 fl. dr.
	Oil of Bergamot		20 min.
	Oil of Rose Geranium		20 ,,
	Oil of Rosemary		1 fl. dr.
	Rectified Spirit		5 fl. oz.
	Rose Water	to	1 pint
2.	Spirit of Rosemary		2 fl. oz.
	Tincture of Cantharides		1 ,,
	Glycerin		1 ,,
	Eau de Cologne		2 fl. oz.
	Rose Water	to	1 pint
3.	Resorcin		2 dr.
	Acetic Acid		1 fl. oz.
	Oil of Rosemary		30 min.
	Vinegar of Cantharides		1 fl. oz.
	Bay Rum		5 ,,
	Rose Water	to	1 pint

Stimulating Lotion

1.	Quinine Hydrochloride		5 gr.
	Pilocarpine Hydrochloride		2 ,,
	Tincture of Cantharides		2 fl. oz.
	Oil of Rosemary		5 drops
	Chlorophyll		a trace
	Rose Water to		10 fl. oz.

2. Tincture of Cantharides . 1 fl. oz.
   Tincture of Capsicum . 1 fl. dr.
   Tincture of Jaborandi . 1 fl. oz.
   Aromatic Vinegar . . 1 ,,
   Rose Water . . to 10 ,,
3. Pilocarpine . . . 10 gr.
   Tincture of Quillaia . . 4 fl. dr.
   Spirit of Rosemary . . 4 ,,
   Concentrated Decoction of Cinchona (1–7) . to 10 fl. oz.

Mix, stand seven days, and filter.

Lotion for Baldness

(Alkaline)

Borax . . . . 1 dr.
Glycerin . . . . 2 ,,
Tincture of Cantharides . 1 fl. oz.
Solution of Ammonia, ·959 . 1 ,,
Bay Rum . . . . 1 ,,
Distilled Water . . to 6 fl. oz.

Mix, and filter bright.

(Acetic)

Aromatic Vinegar . . 2 fl. dr.
Glycerin . . . . 2 ,,
Rectified Spirit . . . 1 fl. oz.
Blistering Liquid, B.P. . 2 fl. dr.
Orange Flower Water . . 2 fl. oz.
Rose Water . . to 6 ,,

Mix, and filter bright.

Directions.—Rub the Alkaline lotion into the roots of the hair with a sponge every night for seven days, and shampoo thoroughly.

Rub in the Acetic lotion in the same way every morning for seven days. Afterwards shampoo well.

Simple Shampoo

Purest White Soap . . 1 oz.
20 per cent. Alcohol . to 1 pint

Dissolve by gentle heat, cool, and add—

Essence of Eau de Cologne . 30 drops
Chlorophyll . . . to tint pale green

Filter bright.

NOTES.—Shampoo lotions should on no account be made with soft soap. It is most difficult to remove from the hair.

If made with water only, this lotion gelatinises.

Scurf Lotion

Salicylic Acid, β-Naphthol, Resorcin	of each	30 gr.
Glycerin		1 fl. dr.
Eau de Cologne		2 fl. oz.
Rectified Spirit		6 ,,
Rose Water	to	1 pint

This is an effectual remedy for scurf.

Erasmus Wilson's Lotion

Almond Oil		1 fl. oz.
Solution of Ammonia, ·959		1 ,,
Honey Water, Spirit of Rosemary (1 in 50)	of each	3 ,,

True Egg Julep

Egg Yolk	2 fl. oz.
Chloroform Water (saturated)	2 ,,

Triturate thoroughly, and add—

Concentrated Infusion of Quillaia	1 fl. oz.
Salicylic Acid	5 gr.
Camphor	10 ,,
Borax	30 ,,
Eau de Cologne	3 fl. oz.
Saturated Chloroform Water to	1 pint

Shake thoroughly and strain through fine muslin.

Directions.—Thoroughly wet the hair, and pour on one or two tablespoonfuls of the julep. Rub until a lather forms, well rinse with warm water, and dry.

Unlike the ordinary shampoo lotions, this leaves the hair soft and pliant.

So-called Egg Julep

Pure Castile Soap (in shavings)		1 oz.
Solution of Ammonia		1 fl. oz.
Lavender Water		1 ,,
20 per cent. Alcohol	to	1 pint

Use gentle heat to dissolve.

So-called Egg Shampoo Lotion

Coco-Nut Oil Soap	1 lb.
Water	3 gals.

Dissolve by heat, and add—

Potassium Carbonate	3 oz.
Oil of Lavender	4 fl. dr.
Aniline Yellow	a sufficiency

Borax, Rosemary and Camphor Hair Wash Powder

1.	Borax	1 lb.
	Camphor	1 oz.
	Oil of Rosemary	40 min.
	Caramel B.	to tint
2.	Borax	1 lb.
	Potassium Carbonate	2 oz.
	Camphor	1 ,,
	Oil of Rosemary	1 fl. dr.

Linimentum Crinale (Squire)

Cantharidin	1 gr.
Acetic Ether	6 fl. dr.
Oil of Lavender	15 min.
Castor Oil	1 fl. oz.
Rectified Spirit	3 ,,

Nursery Lotions

These are used for destroying pediculi. Picrotoxin is also very effective, but it is exceedingly poisonous, especially if there is any broken skin. Saponin, which is contained in Quillaia, is equally fatal, but harmless to children.

1.	Carbolic Acid	1 dr.
	Zinc Sulphate	2 ,,
	Spirit of Rosemary	1 fl. oz.
	Infusion of Quillaia to	1 pint
2.	Bruised Stavesacre Seeds	1 oz.
	90 per cent. Alcohol	1 fl. oz.
	Acetic Acid	¼ ,,
	Oil of Rosemary	10 drops
	Boiling Water	½ pint

Infuse for an hour, stirring occasionally, strain, press, filter, and add—

	Carbolic Acid	1 dr.
	Infusion of Quillaia to	1 pint
3.	Spirit of Rosemary	1 fl. oz.
	Solution of Cochineal or Caramel	sufficient to colour
	Infusion of Quillaia to	1 pint

Hair Oils

Liquid paraffin is one of the cheapest and most satisfactory of hair oils. The B.P. preparation, however, is too stickly, causing the hairs to clog together. *Atoleine*, which is well known in commerce, is a thin variety of Liquid Paraffin admirably adapted for the hair. It is so little inflammable that a lighted taper plunged into it is immediately extinguished.

Other suitable oils are Olive, Nut, Almond, and the so-called Oil of Peach-kernel.

Colours for Hair Oils

Green. Chlorophyll Paste.

Yellow. Gamboge digested on a water bath and filtered.
Fat-soluble Aniline Dye.

Brown. Fat-soluble Aniline Dye.

Red. Alkanet Root digested on a water bath and filtered.
Alkannin.
Fat-soluble Aniline Dye.

Floral Odours for Hair Oils

Atoleine or one of the oils enumerated above may be perfumed very delicately by shaking with any concentrated floral perfume. Three drops to each fluid ounce is sufficient. The mixture becomes turbid, but may be rendered quite brilliant by filtering through paper, using a little Kieselguhr to absorb the trace of undissolved Alcohol. The odours most affected by high-class hair specialists are White Lilac, Violet, White Rose, Lily of the Valley, &c.

Perfumes for Cheaper Hair Oils

1. Oil of Lemon . . . 1 fl. oz.
   Oil of Bergamot . . 1 „
   Oil of Rosemary . . ½ „
   Oil of Verbena . . . 5 min.

2. Oil of Lemon . . . 1 fl. oz.
   Oil of Rose Geranium . . ½ „
   Oil of Linaloe . . . ¼ „
   Terpineol . . . . 10 min.

3. Oil of Lemon,
   Oil of Bergamot,
   Oil of Petitgrain,
   Oil of Rosemary,
   Oil of Lavender — of each equal parts

4. Heliotropin,
Vanillin,
Coumarin . . of each 1 gr.
Oil of Clove,
Oil of Lavender,
Oil of Verbena . of each 5 min.
Oil of Bergamot . . 1 fl. oz.

Lime Cream

1. Curd Soap . . . 1½ oz.
Distilled Water . . . 1 pint

Dissolve with heat, and while warm add to—

Nut Oil . . . . 1½ pint
Oil of Lime. . . . 1 fl. dr.
Oil of Bergamot . . 2 „

2. Castor Oil . . . 4 fl. oz.
Almond Oil . . . 14 „

Mix, and add—

Solution of Ammonia, ·880 . 30 min.
Distilled Water . . . 4 fl. oz.

Pomades for the Hair

Castor-oil Pomade

Prepared Lard . . . 1 lb.
Castor Oil . . . . 8 fl. oz.
Cantharides . . . 30 gr.

Digest for six hours on water bath, and strain ; add —

Oil of Lemon . . . 4 fl. dr.
Oil of Bergamot . . 30 min.
Oil of Lavender . . . 10 min.

Stir until nearly cold.

Crystalline Pomade

1. Spermaceti . . . 6 oz.
Almond Oil . . . 24 fl. oz.

Melt, and add when cooling—

Oil of Bergamot . . 2 fl. dr.
Oil of Neroli . . . 30 min.
Oil of Lemon . . . 40 „
Oil of Linaloe . . . 10 „

Do *not* stir, but allow to cool very slowly.

2. Spermaceti . . . 1 oz.
Almond Oil . . . 5 fl. oz.
Oil of Lavender . . 20 min.

3. Spermaceti . . . 2 oz.
Olive Oil . . . . 14 fl. oz.
Green Colouring . . a sufficiency
Oil Soluble Violet Extract . 1 dr.

Nutritive Pomade

Yellow Wax,
Spermaceti . of each 1 oz.
Olive Oil,
Castor Oil . of each 8 fl. oz.
Palm Oil . . . . ½ oz.
Cantharides . . . ½ ,,

Digest for six hours on water bath, strain, and add—

Jasmin Pomade . . 1 oz.
Oil of Neroli . . . 15 min.
Oil of Lemon . . . 30 ,,

Cheap Pomade

Yellow Wax . . . 6 oz.
Hard Paraffin . . . 6 ,,
Lard . . . . 4 lb.
Nut Oil . . . . 2 pints
Palm Oil . . . . 8 oz.

Melt together, and add—

Oil of Lemon,
Oil of Bergamot of each 1 oz.

Marrow Pomade

Clarified Marrow . . . 4 oz.
Prepared Lard . . . 12 ,,
Spermaceti . . . ½ ,,
Almond Oil . . . 7 fl. oz.

Melt, and stir while cooling. Perfume with—

Oil of Ylang Ylang . . 5 min.
Oil of Rose . . . 1 ,,
Oil of Bergamot . . 2 ,,

Jasmin Pomade

Prepared Lard . . . 6 oz.
Yellow Wax . . . 2 dr.
Olive Oil . . . . 8 fl. oz.

Melt together, and add—

Jasmin Concentrated Essence 40 min.
Oil of Neroli . . . 10 ,,
Oil of Bergamot . . 10 ,,

White Pomade

White Wax	1 lb.
Liquid Paraffin	2¾ pints
Nut Oil	5 fl. oz.

Melt together, transfer to a warmed mortar, and to the mixture, very slowly, add—

Borax	1 oz.
Water	½ pint

Whip until a snow-white cream is formed. Add—

Oil of Lemon	1 fl. dr.
Oil of Bergamot	1 ,,
Oil of Rosemary	½ ,,
Oil of Verbena	10 min.

Pomade Colourings

Yellow. Palm Oil; it bleaches when exposed to light.
Gamboge, digested with the fats.
Oil-soluble Aniline Dye, or Safranine dissolved in 45 per cent. Alcohol.

Red. Alkanet Root or Alkannin.
Oil-soluble Aniline Dye.

Green. Oil-soluble Chlorophyll.

Brown. Oil-soluble Aniline Dye.

Lip Salves

1.

Hard Paraffin	1 oz.
Soft Paraffin	1 ,,
Oil of Theobroma	1 dr.
Glycerin	1 fl. dr.
Eosin, in fine powder	30 gr.
Otto of Rose	2 drops

Dissolve the Eosin in the Glycerin; melt the Paraffins; mix and stir until nearly cool, adding the Otto towards the end.

This is properly a lip-stain, as after well rubbing in and wiping off the excess of fat, the colour is fairly permanent.

2.

White Wax	1½ oz.
Almond Oil	3 fl. oz.
Carmine	6 gr.
Otto of Rose	6 drops

Melt the Wax in the Oil; add the Carmine, previously dissolved in a few drops of Solution of Ammonia; stir until nearly cool, and add the Otto.

3. Almond Oil	8 fl. oz.
White Wax	2 oz.
Spermaceti	1 ,,
Alkanet Root	6 dr.
Freshly expressed Oil of Mace	4 ,,
Otto of Rose	30 drops

Melt the first three ingredients together, and digest with the bruised Alkanet Root for thirty minutes on a water bath ; add the Oil of Mace ; strain through flannel, stir, and when nearly cool add the Otto.

4. Oil of Theobroma	1 oz.
Hard Paraffin	6 dr.
Soft Paraffin	18 ,,
Alkanet Root	6 ,,
Eau de Cologne	30 min.
Saccharin	2 gr.
Otto of Rose	6 drops

Digest the melted Paraffins and Theobroma on a water bath with the bruised Alkanet for thirty minutes ; strain through flannel, and when cooling add the remaining ingredients mixed together. Stir until nearly cold.

5. Spermaceti	1 oz.
White Wax	2 ,,
Almond Oil	6 fl. oz.
Alkanet Root	½ oz.

Digest for thirty minutes, and strain through flannel, add—

Oil of Lemon	20 min.
Saccharin	1 gr.
Citric Acid	2 gr.
Water	2 min.

Stir until nearly cold.

NOTES.—*Colour.*—By leaving out the colouring ingredients in any of the above, *white lip salve* results.

Flavourings.—Other favourite flavourings are—

Vanillin, ½ gr. to 1 oz.
Coumarin, ½ gr. to 1 oz.
Heliotropine, ½ gr. to 1 oz.
Aubepine, ¼ gr. to 1 oz.
Jasmin Pomade, 15 gr. to 1 oz.
Tuberose Pomade, 15 gr. to 1 oz.
Saccharin, ½ gr. to 1 oz.

MANICURE PREPARATIONS

Colouring for Finger Tips

Alkanet Root	¼ oz.
Rectified Spirit	6 fl. oz.
Oil of Neroli	3 drops
Otto of Rose	3 „
Rose Water	2 fl. oz.

Macerate three days and filter.

Cuticle Solvent

1.	Glycerin	1 fl. oz.
	Sulphurous Acid	1 „
2.	Diluted Sulphuric Acid	2 fl. dr.
	Tincture of Myrrh	1 „
	Rose Water	to 4 „
3.	Tartaric Acid	1 dr.
	Tincture of Myrrh	1 fl. dr.
	Eau de Cologne	2 „
	Rose Water	to 3 fl. oz.
4.	Potassium Hydroxide	200 gr.
	Glycerin	2 fl. oz.
	Rectified Spirit	½ „
	Rose Water	to 16 „

Cuticle Cream

1.	White Beeswax	¼ oz.
	Soft White Paraffin	1½ lb.
	Soft Soap	1 oz.
	Otto of Rose	40 min.
2.	Soft White Paraffin	½ lb.
	Hard Soap, powder	1 oz.
	Oil of Neroli	10 min.
	Otto of Rose	10 „

Nail Bleach

Tartaric Acid	1 dr.
Rose Water	1 fl. oz.
Elder Flower Water	1 „

Nail Polishes

1.	Precipitated Silica	1 oz.
	Heavy Magnesia	½ „
	Oil of Ylang Ylang	1 drop

Tint with solution of Carmine.

2. Precipitated Silica . . 1 oz.
   Tin Oleate . . . ½ ,,
   Essence of Eau de Cologne . 2 drops

Tint with solution of Carmine.

3. Putty Powder, fine . . ½ oz.
   Carmine . . . . 2 gr.
   Otto of Rose . . . 2 drops

4. Putty Powder, fine . . 1 oz.
   Tragacanth, powder . . 2 gr.
   Glycerin . . . . 1 drop
   Rose Water . . . a sufficiency

After the use of nail polish, a nail varnish should be applied.

Nail Varnish

1. Hard Paraffin . . . 10 gr.
   Otto of Rose . . . 1 drop
   Alkannin . . . . to give rose tint
   Petroleum Ether. . to 1 fl. oz.

Paint on the nails with camel-hair brush. Polish with silk handkerchief.

2. Paraffin Wax . . . ¼ oz.
   Chloroform . . . ½ fl. oz.
   Otto of Rose . . . 5 min.

3. Celluloid, colourless . . 5 gr.
   Acetone . . . . ½ fl. oz.
   Amyl Acetate . . . ½ ,,
   Oil of Rose Geranium . . 10 min.

Lotion for Perspiring Hands and Armpits

Boric Acid . . . 4 dr.
Salicylic Acid . . . 1 ,,
Glycerin . . . . 2 fl. dr.
Rose Water . . . 3 fl. oz.
Eau de Cologne . . to 8 ,,

To Whiten the Hands

It is of course difficult to make the hands soft and white if manual or dirty work has to be performed, but the average woman's hands may be vastly improved by the following procedure adopted by the 'beauty specialists':

Thoroughly wash the hands with a pure soap and warm water to which a little oatmeal has been added.

Immediately after drying, rub this lotion well in:

Glycerin . . . . 1 fl. oz.
Eau de Cologne . . 2 fl. dr.
Elder Flower Water . to 4 fl. oz.

Then, while the skin is still supple and somewhat moist, anoint thinly with the following ointment, and put on a pair of loose kid gloves:

Prepared Lard . . .	1 oz.
Anhydrous Lanolin . .	¼ „

Melt together, and when cooling add—

Solution of Hydrogen Peroxide (20 vol.) . . .	1 fl. dr.
Oil of Ylang Ylang . .	2 drops

It is assumed that this cream will only be applied at bedtime.

Toilet Oatmeal for the Hands and Face

Oatmeal, in No. 80 powder .	1 lb.
Atoleine	1 fl. oz.
Oil of Ylang Ylang . .	2 drops
Otto of Rose . . .	1 drop

Mix the Oils and Atoleine intimately with a few ounces of the powder first, then gradually dilute with the remainder.

MISCELLANEOUS

Water Softeners

1. Slaked Lime . . .	½ oz.
Dried Sodium Carbonate .	2 „

A teaspoonful stirred up with a ewer of water overnight, and allowed to deposit, is an effectual water softener.

2. Sodium Sesquicarbonate is fine needles, tinted with Methyl Violet, and perfumed to taste, is commonly sold as a water softener.

Toilet Ammonia

Solution of Ammonia, ·880 .	1 fl. oz.
Oleic Acid . . .	1 dr.
Oil of Lavender . . .	10 min.
Distilled Water . . .	12 fl. oz.

Mix the Oleic Acid and Essential Oil, and add to the Ammonia before diluting with the water.

Hair Brush Powder

Dried Sodium Carbonate .	12 oz.
Powdered Castile Soap .	4 „
Oil of Lavender . . .	10 min.
Oil of Verbena . . .	2 „

Sponge Powder

Dried Sodium Carbonate	15 oz.
Sodium Sulphite	1 ,,
Oil of Lavender	10 min.
Oil of Verbena	2 ,,

Add one teaspoonful to a quart of warm water. Soak, squeezing occasionally, for half an hour. Rinse well in clean water.

Removal of Tattoo Marks

Pepsin	1 oz.
Water	5 fl. oz.
Glycerin	15 ,,
Diluted Hydrochloric Acid	1½ fl. dr.

Apply on cotton wool or lint. This method is not recommended. It is better to leave the marks alone.

Liquid Rouge

Carmine	½ oz.
Solution of Potash	¾ fl. oz.
Otto of Rose	15 min.
Rectified Spirit	½ fl. oz.
Glycerin	2 ,,
Rose Water	to 1 pint

Shaving Cream (Non-Soapy)

Tallow	4 oz.
White Beeswax	¾ ,,
Hard Soap	½ ,,
Tragacanth, powder	45 gr.
Starch	¼ oz.
Oil of Lavender	1 fl. dr.
Oil of Bergamot	30 min.
Water	to 1 lb.

Melt the fat and wax and emulsify with a solution of the Soap in ½ pint of warm water. Cool and add the powders, oils and water to make up to weight.

Solidified Cologne

Stearic Acid	1½ oz.
90 per cent. Alcohol	1 pint

Dissolve by gentle heat, add—

Essence of Eau de Cologne	½ fl. oz.

Stir, and add the following warm solution—

Sodium Carbonate Crystals	1 oz.
Water	3 fl. oz.

Mix, and pour into suitable moulds to set.

Solidified Cologne with Menthol

Stearic Acid	$1\frac{1}{2}$ oz.
90 per cent. Alcohol	1 pint
Menthol	$\frac{1}{4}$ oz.
Essence of Eau de Cologne	$\frac{1}{2}$ fl. oz.
Sodium Carbonate Crystals	1 oz.
Water	3 fl. oz.

Proceed as for Solidified Cologne, adding the Menthol with the Essence of Eau de Cologne.

PART VI

PERFUMES

NOTE.—*Floral Essences.*—These must be extracted from the pomades in the cold. If heat is employed, the essence must be chilled before filtering.

Alcohol.—This must be what is commonly known as 'Grape Spirit' or 'Perfume Spirit.' The ordinary Rectified Spirit used for tincture-making is much too coarse for perfumes, and should never be employed.

Compound Essences.—All compounded perfumes require keeping before any opinion can be expressed as to the quality. The various oils and aromatic principles seem to react, possibly forming definite chemical compounds, the final product being so blended that it is often an impossible task to say what ingredients have been used. The shortest time in which any perfume can be considered fit for sale is one month, and there can be no doubt that the longer it is kept the better.

Where considerable quantities have to be kept, the locking-up of capital in Alcohol is avoided by making concentrated preparations, which are diluted to the required strength a week or two before use.

Simple Essences

Essence of Ambergris

Fine Grey Ambergris	.	80 gr.
80 per cent. Alcohol	to	1 pint

Essence of Abelmoschus

Hibiscus Seeds	.	8 oz.
80 per cent. Alcohol	to	1 pint

Essence of Civet

Civet	.	80 gr.
Washed Sand	.	a sufficiency
80 per cent. Alcohol	to	1 pint

Essence of Musk

Fine Grain Musk	.	80 gr.
Washed Sand	.	a sufficiency
80 per cent. Alcohol	to	1 pint

Essence of Orris

Orris Powder		8 oz.
80 per cent. Alcohol	to	1 pint

Essence of Vanilla

Vanilla		1 oz.
Washed Sand		a sufficiency
80 per cent. Alcohol	to	1 pint

Essence of Patchouli

Oil of Patchouli		40 min.
80 per cent. Alcohol	to	1 pint

Floral Essences

Jasmin, Tuberose, Cassie &c., are made by extracting 1 lb. of Floral Pomade with 1 pint of 80 per cent. Alcohol.

Compound Essences

Bridal Bouquet

Coumarin	5 gr.
Otto of Rose	15 min.
Essence of Vanilla	1 fl. oz.
Essence of Musk	2 ,,
Essence of Jasmin	5 ,,
Tincture of Benzoin	½ ,,

Ess Bouquet

1. Otto of Rose	10 min.
Oil of Neroli	20 ,,
Oil of Bergamot	30 ,,
Oil of Lemon	30 ,,
Essence of Orris	10 fl. oz.
Essence of Ambergris	1 ,,
Essence of Musk	1 ,,
Rectified Spirit, 80 per cent.	10 ,,
2. Oil of Neroli	20 min.
Oil of Bergamot	30 ,,
Essence of Cassie	2 fl. oz.
Essence of Jasmin	4 ,,
Essence of Orris	5 ,,
Otto of Rose	10 min.
80 per cent. Alcohol	10 fl. oz.

Chypre

1.	Oil of Rosemary	10 min.
	Oil of Lemon	15 ,,
	Oil of Bergamot	30 ,,
	Oil of Neroli	10 ,,
	Oil of Petitgrain	15 ,,
	Oil of Verbena	10 ,,
	Oil of Patchouli	2 ,,
	Essence of Jasmin	2 fl. oz.
	Essence of Tuberose	2 ,,
	Essence of Musk	2 ,,
	Tincture of Benzoin	1 ,,
	80 per cent. Alcohol	13 ,,

2.	Oil of Neroli, Oil of Bergamot, Oil of Rosemary, Oil of Lavender, Oil of Lemon	of each 15 min.
	Otto of Rose	10 ,,
	Essence of Jasmin	2 fl. oz.
	Essence of Tuberose	4 ,,
	Tincture of Benzoin	1 ,,
	80 per cent. Alcohol	13 ,,

Carnation

Carnation, synthetic	20 min.
Oil of Clove	10 ,,
Otto of Rose	30 ,,
Essence of Jasmin	2 fl. oz.
Essence of Tuberose	2 ,,
Essence of Cassie	2 ,,
Essence of Vanilla	1 ,,
Essence of Civet	1 ,,
Tincture of Benzoin	1 ,,
80 per cent. Alcohol	11 ,,

Sweet Cherry ~~Blossom~~

1.	Heliotropin	40 gr.
	Aubepin	2 ,,
	Coumarin	2 ,,
	Otto of Rose	5 min.
	Essential Oil of Almond	5 ,,
	Essence of Musk	1 fl. oz.
	Essence of Vanilla	1 ,,
	Essence of Jasmin	2 ,,
	90 per cent. Alcohol	16 ,,

2. Heliotropin . . . 30 gr.
Oil of Bergamot . . . 15 min.
Oil of Lemon . . . 15 ,,
Essential Oil of Almond . 5 ,,
Essence of Jasmin . . 2 fl. oz.
80 per cent. Alcohol . . 18 ,,

Clove Pink

Oil of Clove . . . 12 min.
Otto of Rose . . . 10 ,,
Oil of Neroli . . . 15 ,,
Essence of Vanilla . . 1 fl. oz.
Essence of Tuberose . . 3 ,,
Essence of Jasmin . . 2 ,,
Essence of Musk . . 1 ,,
80 per cent. Alcohol . to 13 ,,

Hyacinth

1. Hyacinthin . . . 30 min.
Coumarin . . . . 8 gr.
Vanillin . . . . 8 ,,
Essence of Jasmin . . 4 fl. oz.
Essence of Tuberose . . 2 ,,
Otto of Rose . . . 10 min.
Tincture of Benzoin . . ½ fl. oz.
Terpineol . . . . 3 min.
80 per cent. Alcohol . to 1 pint

2. Hyacinthin . . . 15 min.
Heliotropin . . . 15 gr.
Terpineol . . . . 10 min.
Synthetic Musk . . . 15 gr.
Vanillin . . . . 10 ,,
Coumarin . . . . 10 ,,
80 per cent. Alcohol . to 1 pint

Frangipanni

Oil of Rose Geranium . . 10 min.
Oil of Neroli . . . 15 ,,
Oil of Bergamot . . 20 ,,
Oil of Verbena . . . 5 ,,
Otto of Rose . . . 10 ,,
Oil of Sandalwood . . 20 ,,
Oil of Vetivert . . . 5 ,,
Oil of Patchouli . . . 2 ,,
Essence of Tuberose . . 2 fl. oz.
Essence of Jasmin . . 5 ,,
Essence of Vanilla . . 1 ,,
Tincture of Benzoin . . 1 ,,
80 per cent. Alcohol . . 11 ,,

Honeysuckle

Oil of Neroli, Oil of Bergamot	of each	10 min.
Essential Oil of Almond		3 ,,
Hyacinthin		3 ,,
Aubepin		2 ,,
Coumarin		2 gr.
Essence of Cassie		1 fl. oz.
Essence of Violet		2 ,,
Essence of Jasmin		3 ,,
Essence of Vanilla		1 ,,
Tincture of Benzoin		1 ,,
80 per cent. Alcohol		12 ,,

Jockey Club

Otto of Rose	10 min.
Oil of Ylang Ylang	5 ,,
Essential Oil of Almond	2 ,,
Essence of Civet	1 fl. oz.
Essence of Musk	1 ,,
Essence of Jasmin	3 ,,
Essence of Cassie	1 ,,
Essence of Orris	1 ,,
80 per cent. Alcohol	13 ,,

White Lilac

1.

Terpineol	40 min.
Hyacinthin	12 ,,
Oil of Ylang Ylang	5 ,,
Heliotropin	2 gr.
Coumarin	2 ,,
Essence of Musk	½ fl. oz.
Essence of Ambergris	½ ,,
Essence of Jonquil	3 ,,
Essence of Tuberose	3 ,,
Essence of Jasmin	3 ,,
80 per cent. Alcohol	10 ,,

2.

Oil of Ylang Ylang	20 min.
Heliotropin	20 gr.
Terpineol	20 min.
Essence of Abelmoschus	½ fl. oz.
Essence of Civet	½ ,,
Tincture of Benzoin	½ ,,
Coumarin	2 gr.
Vanillin	4 ,,
Essence of Jasmin	3 fl. oz.
Essence of Tuberose	4 ,,
80 per cent. Alcohol	13 ,,

3. Terpineol . . . . 40 min.
Oil of Bergamot . . . 30 ,,
Coumarin . . . . 5 gr.
Vanillin . . . . 5 ,,
Tincture of Benzoin . . 1 fl. oz.
80 per cent. Alcohol . to 1 pint

White Lily

Essential Oil of Almond . 5 min.
Otto of Rose . . . 10 ,,
Essence of Orris . . 1 fl. oz.
Ionone . . . . 2 min.
Essence of Vanilla . . 1 fl. oz.
Essence of Orange Flowers . 1 ,,
Essence of Jasmine . . 5 ,,
Essence of Tuberose . . 3 ,,
80 per cent. Alcohol . . 11 ,,

Lily of the Valley

White Lily Perfume . . 15 fl. oz.
Oil of Linaloe . . . 10 min.
Terpineol . . . 5 ,,
Oil of Clove . . . 1 ,,
80 per cent. Alcohol . . 5 fl. oz.

White Heliotrope

1. Heliotropin . . . 35 gr.
Aubepin . . . . 5 min.
Otto of Rose . . . 5 ,,
Oil of Neroli . . . 10 ,,
Essential Oil of Almond . 5 ,,
Essence of Musk . . 1 fl. oz.
Essence of Jasmin . . 2 ,,
Essence of Tuberose . . 1 ,,
80 per cent. Alcohol . . 10 ,,

2. Heliotropin . . . 40 gr.
Oil of Bergamot,
Oil of Lemon,
Oil of Rosemary,
Oil of Petitgrain of each 15 min.
Oil of Sandalwood . . 5 ,,
Oil of Rose Geranium . . 5 ,,
Tincture of Benzoin . . 1 fl. oz.
Coumarin . . . . 3 gr.
Vanillin . . . . 5 ,,
80 per cent. Alcohol . to 1 pint

Mignonette

Oil of ' Rose-Mignonette ' . 10 min.
Essential Oil of Almond . 1 ,,

Essence of Civet	2 fl. dr.
Essence of Musk	1 fl. oz.
Essence of Violet	1 ,,
Essence of Jasmin	3 ,,
Essence of Orris	½ ,,
Essence of Tuberose	2 ,,
Essence of Vanilla	1 ,,
Tincture of Benzoin	½ ,,
80 per cent. Alcohol	11 ,,

New Mown Hay

1. Coumarin	30 gr.
Otto of Rose	5 min.
Vanillin	20 gr.
Heliotropin	10 ,,
Terpineol	5 min.
Ionone	5 ,,
Oil of Neroli	5 ,,
Oil of Patchouli	1 ,,
Essence of Tuberose	2 fl. oz.
Essence of Jasmin	4 ,,
Tincture of Benzoin	½ ,,
80 per cent. Alcohol	14 ,,
2. Coumarin	15 gr.
Vanillin	10 ,,
Terpineol	3 min.
Essence of Orris	1 fl. oz.
Oil of Bergamot	3 fl. dr.
Oil of Lemon	1 ,,
Oil of Rose Geranium	10 min.
80 per cent. Alcohol	to 1 pint

Millefleurs

Oil of Neroli	20 min.
Oil of Bergamot	30 ,,
Oil of Rosemary	20 ,,
Oil of Lemon	30 ,,
Oil of Lavender	10 ,,
Oil of Clove	3 ,,
Coumarin	8 gr.
Essence of Vanilla	1 fl. oz.
Essence of Orris	1 ,,
Otto of Rose	10 min.
Essence of Jasmin	3 fl. oz.
Essence of Cassie	2 ,,
Essence of Jonquil	3 ,,
80 per cent. Alcohol	12 ,,

Moss Rose, Tea Rose, White Rose

1. Otto of Rose . . . 90 min.
   Oil of Patchouli . . . 5 ,,
   Oil of Sandalwood . . 5 ,,
   Oil of Rose Geranium . . 3 ,,
   Essence of Musk . . 1 fl. oz.
   Essence of Vanilla . . 1 ,,
   Essence of Jasmin . . 5 ,,
   Essence of Tuberose . . 2 ,,
   Essence of Jonquil . . 1 ,,
   Essence of Orris . . . 1 ,,
   80 per cent. Alcohol . . 9 ,,

2. Otto of Rose . . . 90 min.
   Oil of Patchouli . . . 15 ,,
   Essence of Musk . . 2 fl. oz.
   Essence of Ambergris . . 1 ,,
   Essence of Orris . . ½ ,,
   Essence of Jasmin . . 4 ,,
   Essence of Tuberose . . 2 ,,
   80 per cent. Alcohol . . 20 ,,

3. Synthetic Otto of Rose . . 60 min.
   Oil of Rose Geranium . . 30 ,,
   Oil of Patchouli . . . 10 ,,
   Coumarin . . . . 5 gr.
   Vanillin . . . . 5 ,,
   Oil of Sandalwood . . 5 min.
   Musk, Synthetic . . 5 gr.
   80 per cent. Alcohol . to 20 fl. oz.

Opoponax

Oil of Lemon,
Oil of Bergamot,
Oil of Neroli . of each 15 min.
Otto of Rose . . 10 ,,
Essence of Musk . . ½ fl. oz.
Essence of Ambergris . . ½ ,,
Oil of Patchouli . . . 2 min.
Oil of Sandalwood . . 3 ,,
Oil of Vetivert . . . 1 ,,
Essence of Jasmin . . 3 fl. oz.
Essence of Tuberose . . 3 ,,
80 per cent. Alcohol . . 14 ,,

Stephanotis

Otto of Rose . . . 15 min.
Heliotropin . . . 5 gr.
Coumarin . . . . 5 ,,
Vanillin . . . . 5 ,,

Terpineol	5 min.
Essence of Musk	1 fl. oz.
Essence of Orris	1 ,,
Essence of Jasmin	3 ,,
Eau de Cologne	15 ,,

Violet, Wood Violet, Violet de Parme

1.	Ionone	30 min.
	Essence of Orris	2 fl. oz.
	Oil of Ylang Ylang	8 min.
	Oil of Linaloe	5 ,,
	Terpineol	2 ,,
	Otto of Rose	8 ,,
	Essence of Jasmin	5 fl. oz.
	Essence of Tuberose	2 ,,
	Essence of Cassie	3 ,,
	Essence of Musk	½ ,,
	Tincture of Benzoin	½ ,,
	Chlorophyll	a sufficiency
	80 per cent. Alcohol	9 fl. oz.
2.	Ionone	30 min.
	Essence of Orris	4 fl. oz.
	Essence of Musk	1 ,,
	Otto of Rose	10 min.
	Essence of Jasmin	6 fl. oz.
	80 per cent. Alcohol	to 1 pint
3.	Ionone	80 min.
	Oil of Neroli, Oil of Bergamot, Oil of Lemon, Otto of Rose	of each 15 min.
	Essential Oil of Almond	2 ,,
	Essence of Jasmin, Essence of Cassie, Essence of Tuberose, Essence of Orange Flowers	of each 2 fl. oz.
	Essence of Vanilla	2 fl. dr.
	Tincture of Benzoin	2 ,,
	80 per cent. Alcohol	12 fl. oz.
4.	Ionone	60 min.
	Otto of Rose	10 ,,
	Oil of Lemon, Oil of Bergamot, Oil of Neroli, Oil of Linaloe, Oil of Ylang Ylang	of each 5 min.

Essential Oil of Almond	2 min.
Essence of Wood Violet	5 fl. oz.
Essence of Cassie,	
Essence of Jasmin,	
Essence of Tuberose,	
Essence of Jonquil of each	3 fl. oz.
80 per cent. Alcohol	4 ,,

5.

Ionone	2 fl. dr.
Oil of Sandalwood	4 ,,
Oil of Neroli	1 ,,
Essential Oil of Almond	8 min.
Oil of Spearmint	1 ,,
Heliotropin	1 gr.
Musk	2 ,,
Civet Essence	2 fl. oz.
Extract of Cassie	4 ,,
Extract of Violet	10 ,,
Distilled Water	1 pint
90 per cent. Alcohol	6 ,,

Keep for at least one month before use. The violet odour does not develop for some time.

Sweet Briar

Essence of Musk	1 fl. oz.
Essence of Jasmin	2 ,,
Essence of Tuberose	1 ,,
Otto of Rose	10 min.
Eau de Cologne	16 fl. oz.

Sweet Pea

Coumarin	5 gr.
Vanillin	5 ,,
Terpineol	2 min.
Essence of Musk	1 fl. oz.
Otto of Rose	8 min.
Tincture of Benzoin	½ fl. oz.
Essence of Tuberose	2 ,,
Essence of Jasmin	2 ,,
Essence of Violet	1 ,,
Eau de Cologne	15 ,,

Wallflower

Oil of Rose Geranium,	
Oil of Linaloe,	
Oil of Ylang Ylang,	
Oil of Clove,	
Essential Oil of Almond,	
Oil of Neroli of each	5 min.

Coumarin	5 gr.
Essence of Musk	1 fl. oz.
Essence of Orris	1 ,,
Essence of Jasmin	4 ,,
Essence of Tuberose	3 ,,
Essence of Vanilla	1 ,,
80 per cent. Alcohol	20 ,,

Ylang Ylang

Oil of Ylang Ylang	40 min.
Otto of Rose	20 ,,
Oil of Neroli	15 ,,
Oil of Bergamot	15 ,,
Essence of Musk	2 fl. oz.
Essence of Vanilla	1 ,,
Essence of Jasmin	4 ,,
Essence of Tuberose	2 ,,
80 per cent. Alcohol	to 20 fl. oz.

Honey Water (*Aqua Mellis*)

1.

Oil of Clove, Oil of Lavender, Oil of Bergamot, Oil of Lemon	of each ½ fl. oz.
Musk	15 gr.
Oil of Sandalwood	10 min.
Orange Flower Water	2 pints
Rose Water	2 ,,
Rectified Spirit	1 gal.

2.

Oil of Sandalwood	30 min.
Musk	20 gr.
Oil of Bergamot	2 fl. oz.
Oil of Clove	5 fl. dr.
Oil of Lavender	5 ,,
Rose Water	2 pints
Elder Flower Water	2 ,,
Rectified Spirit	1 gal.

3.

Oil of Bergamot	2 fl. dr.
Oil of Lemon	2 ,,
Oil of Clove	10 min.
Ambergris	5 gr.
Musk	5 ,,
Vanillin	2 ,,
Rose Water	3 fl. oz.
Orange Flower Water	3 ,,
Rectified Spirit	1½ pint

4. Coriander Seed, bruised . 7 lb.
Cloves . . . . 12 oz.
Storax . . . . 8 ,,
Fresh Lemon Peel . . 10 ,,
Calamus Root . . . 6 ,,
Rectified Spirit . . . 15 pints

Macerate for a fortnight, add 1½ gal. water, and distil 22 pints ; add to the distillate—

Orange Flower Water . . 5 pints
Otto of Rose . . . 24 min.
Ambergris . . . . 1 dr.
Vanilla . . . . 2 oz.

Macerate for a fortnight, and filter.

Florida Water

1. Oil of Lavender,
Oil of Bergamot,
Oil of Lemon . of each 2 fl. dr.
Oil of Neroli . . . 1 ,,
Oil of Melissa . . . 30 min.
Oil of Rose . . . 10 ,,
Oil of Ylang Ylang . . 5 ,,
Rectified Spirit . . to 2 pints

Mix, and add distilled water, little by little, until a faint opalescence appears. Stand seven days, and filter.

2. Oil of Bergamot . . . ½ fl. oz.
Oil of Lemon . . . ¾ ,,
Oil of Lavender . . . 1 fl. dr.
Oil of Clove . . . ½ ,,
90 per cent. Alcohol . . 15 fl. oz.
Distilled Water . . . 5 ,,

Eau de Portugal

1. Oil of Bitter Orange Peel . 4 fl. dr.
Oil of Lemon,
Oil of Verbena,
Oil of Neroli,
Oil of Bergamot,
Otto of Rose . of each 15 min.
80 per cent. Alcohol . to 1 pint

2. Oil of Neroli,
Oil of Bergamot,
Oil of Rosemary,
Oil of Lemon,
Oil of Lavender . of each 30 min.
80 per cent. Alcohol . to 1 pint

Hungary Water

Eau de Cologne	. .	5 fl. oz.
Lavender Water	. .	5 ,,
Rose Water	. . .	5 ,,
Spirit of Rosemary (1 in 50)	to	1 pint

Lavender Water

NOTE.—*If expense is no object, only English Lavender Oil should be used.*

1.	Oil of Lavender	. .	4 fl. oz.
	Oil of Bergamot	. .	1 ,,
	Essence of Ambergris	. .	4 fl. dr.
	Rectified Spirit	. . .	1 gal.
	Orange Flower Water	. .	5 fl. oz.
2.	Oil of Lavender	. .	3 fl. oz.
	Oil of Bergamot	. .	1 fl. dr.
	Essence of Ambergris	. .	1 fl. oz.
	Essence of Musk	. .	1 ,,
	Orange-flower Water	. .	4 ,,
	Rose Water	. . .	4 ,,
	Rectified Spirit	. . to	1 gal.
3.	Oil of Lavender	. . .	2 fl. oz.
	Essence of Ambergris	. .	1 ,,
	Eau de Cologne	. . .	1 pint
	Rectified Spirit	. . .	2 ,,
4.	Oil of Lavender	. . .	4 dr.
	Oil of Bergamot	. .	20 min.
	Oil of Lemon	. . .	20 ,,
	Otto of Rose	. . .	10 ,,
	Rectified Spirit	. . to	2 pints
5.	Oil of Lavender	. . .	3 flr. dr.
	Oil of Bergamot	. .	20 min.
	Oil of Neroli	. . .	10 ,,
	Oil of Rose	. . .	6 ,,
	Oil of Lemon	. . .	10 ,,
	Essence of Musk	. .	2 fl. dr.
	Oil of Sandalwood	. .	2 min.
	Rectified Spirit	. . .	30 fl. oz.
6.	Oil of Lavender	. . .	4 fl. oz.
	Essence of Musk, Essence of Ambergris, Essence of Vanilla	of each	1 fl. oz.
	Oil of Bergamot	. .	1½ ,,
	Oil of Clove	. . .	5 min.
	Oil of Sandalwood	. .	2 ,,
	Rectified Spirit	. . to	1 gal.

Eau de Cologne

1. Oil of Lavender,
   Oil of Bergamot,
   Oil of Lemon,
   Oil of Neroli . of each 1 fl. oz.
   Oil of Cinnamon . . ¼ ,,
   Oil of Rosemary . . ¼ ,,
   Rectified Spirit . . . 9 pints
2. Oil of Bergamot,
   Oil of Citron,
   Oil of Lemon . of each 2 fl. oz.
   Oil of Rosemary,
   Oil of Neroli,
   Oil of Lavender . of each 1 fl. oz.
   Oil of Melissa . . . ¼ ,,
   Rectified Spirit . . to 1 gal.
3. Oil of Bergamot,
   Oil of Lemon,
   Oil of Orange Peel,
   Oil of Neroli,
   Oil of Rosemary . of each 3 fl. dr.
   Cardamom Seed . . 1 oz.
   Rectified Spirit . . to 1 gal.
4. Oil of Bergamot,
   Oil of Lemon,
   Oil of Rosemary,
   Oil of Orange Peel,
   Oil of Neroli,
   Oil of Melissa . of each 1 fl. oz.
   Oil of Caraway,
   Oil of Sandalwood of each 5 drops
   Rectified Spirit . . to 1 gal.
5. *Essence of Eau de Cologne for Perfuming Specialities*

This may consist of the oils *only* from any of the above formulas.

Antiseptic Cologne

Carbolic Acid . . . ½ dr.
Bornyl Acetate . . . ½ fl. dr.
Eau de Cologne . . . 8 fl. oz.

Mentholated Cologne

Menthol . . . . ¼ oz.
Eau de Cologne . . . 1 pint

Solid Perfumes

Paraffin Basis

Hard Paraffin . . . 4 oz.
Kaolin . . . . ½ ,,
Concentrated Essence * . 1 fl. dr.

* Any floral perfume minus alcohol.

Melt the Paraffin, and just as it begins to thicken add the Kaolin, with which the Concentrated Essence has been intimately mixed.

Pour into circular tin moulds, which have previously been wiped out with cotton dipped in alcoholic solution of Soft Soap (1 in 50).

Plaster of Paris Basis

Finest Plaster of Paris (Parian Cement)	4 oz.
Dried Sodium Chloride, in fine powder	20 gr.

Mix well, add Methyl Violet dissolved in a little Absolute Alcohol, and triturate until evenly mixed.

Make into a cream with water, and add quickly—

Concentrated Essence	1 fl. dr.

Stir, and pour into circular tin moulds.

NOTE.—Violet medallions should be tinted with Chlorophyll.

Pot Pourri

1. Calamus Root	1 oz.
Sandalwood	1 ,,
Vanilla	1 dr.
Musk	8 gr.
Ambergris	8 ,,
Cascarilla	1 oz.
Orris	3 ,,
Cinnamon	1 ,,
Lavender Flowers	1 ,,
Storax	2 dr.
Benzoin	2 ,,
Cloves	2 ,,
Coriander	1 oz.
Nutmeg	2 dr.
Oil of Rose	20 min.
Oil of Neroli	10 ,,

The above is an old-fashioned type, but if allowed to blend in a closed vessel for some weeks, it is approved by some, and is very lasting.

2. The following recipe has been handed down in one family for over 150 years :

Gather any sweet smelling flowers or leaves ; when quite dry put them into a large jar, and salt them with Bay Salt, frequently stirring to keep the whole moist and free from decay. In three or four days add the following—

Prepared Storax,
Gum Benjamin,
Cloves, bruised,
Nutmeg, bruised,
Coriander Seed, bruised,
Angelica Seed, bruised,
Orange Peel, bruised,
Orris Root, powder of each 1 oz.
Grain Musk . . . 5 gr.

Mix thoroughly.

Sachet Powders

Basis A

Powdered Patchouli,	
Powdered Lavender,	
Powdered Rose,	
Powdered Sandalwood,	
Powdered Vetivert,	
Powdered Cedarwood, of each	2 oz.
Powdered Orris . . .	4 ,,
Powdered Hibiscus Seed .	1 ,,
Powdered Clove . .	¼ ,,

This is a most useful and enduring basis, and can be employed for the manufacture of all kinds of sachet powders by adding a suitable 'top' perfume, and allowing to mellow. The following are excellent. If cheaper quality is required, dilute with powdered Starch.

1. *Carnation*

Basis A	2 oz.
Clove	¼ ,,
Vanillin	3 gr.
Coumarin	2 ,,
Aubepin	2 min.
Oil of Bergamot . .	5 ,,
Concentrated Carnation .	10 ,,

2. *Chypre*

Basis A	1½ oz.
Orris	¼ ,,
Patchouli	¼ ,,
Musk Synthetic . .	5 gr.
Oil of Beroli . .	5 min.
Oil of Bergamot . .	5 ,,
Vanillin	2 gr.
Coumarin	2 ,,
Concentrated Chypre . .	8 min.

3. *Heliotrope*

Basis A	2 oz.
Essential Oil of Almond	5 min.
Heliotropin	10 gr.
Vanillin	5 „
Concentrated White Heliotrope	10 min.

4. *Hyacinth*

Basis A	1 oz.
Orris	1 oz.
Vanillin	3 gr.
Coumarin	2 „
Musk Synthetic	1 „
Hyacinthin	1 „
Oil of Linaloe	2 min.
Concentrated Hyacinth	8 „

5. *White Lilac*

Basis A	1½ oz.
Orris	½ „
Aubepin	5 min.
Vanillin	5 gr.
Coumarin	5 „
Terpineol	5 min.
Concentrated White Lilac	8 „

6. *Lily of the Valley*

Basis A	2 oz.
Vanillin	10 gr.
Coumarin	5 „
Terpineol	5 min.
Oil of Linaloe	5 „
Concentrated Lily of the Valley	10 „

7. *New Mown Hay*

Basis A	1 oz.
Orris	1 „
Vanillin	5 gr.
Coumarin	10 „
Oil of Ylang Ylang	2 min.
Concentrated New Mown Hay	10 „

8. *White Rose*

Basis A	1½ oz.
Patchouli leaves	½ ,,
Vanillin	3 gr.
Oil of Rose Geranium	2 min.
Otto of Rose	5 ,,

9. *Wood Violet*

Basis A	1 oz.
Orris	1 ,,
Vanillin	5 gr.
Coumarin	1 ,,
Oil of Ylang Ylang	1 min.
Ionone	5 ,,
Concentrated Wood Violet	5 ,,

(Alternative formulas)

Heliotrope

Heliotropin	20 gr.
Orris	4 oz.
Rose Leaves	½ ,,
Benzoin	1 dr.
Coumarin	1 gr.
Vanillin	1 ,,
Essential Oil of Almond	2 drops
Oil of Ylang Ylang	1 drop
Musk Synthetic	½ gr.

Violet

Orris Root	4 oz.
Musk Synthetic	1 gr.
Ionone	2 drops
Vanillin	1 gr.
Coumarin	½ ,,

Carnation

Powdered Patchouli	¼ oz.
Orris Root	4 ,,
Oil of Clove	6 drops
Oil of Rose	3 ,,
Oil of Sandalwood	2 ,,
Coumarin	1 gr.
Vanillin	1 ,,
Œillet	5 min.

Peau d'Espagne (*Spanish Leather*)

This, when well prepared, is one of the most lasting sachets known. It is especially suitable for placing among gloves, notepaper, &c.

Benzoin	2 oz.
Balsam of Peru	2 dr.
Vanilla	3 ,,
Musk	30 gr.
Civet	10 ,,
Heliotropin	5 ,,
Coumarin	15 ,,
Oil of Lemon,	
Oil of Bergamot,	
Oil of Sandalwood,	
Oil of Rose,	
Oil of Rose Geranium,	
Oil of Neroli,	
Oil of Ylang Ylang,	
Oil of Clove,	
Oil of Linaloe,	
Oil of Lavender	of each 30 min.
Oil of Vetivert	5 ,,
Essential Oil of Almond	5 ,,
Rectified Spirit	1 fl. oz.
Glycerin	2 dr.

Rub together until a perfectly smooth paste is obtained; transfer to a wide mouth bottle with sufficient Rectified Spirit to produce 1 pint. Macerate for at least one month.

In this soak small squares of chamois leather. Allow to drain, and dry. Paste the perfumed leather between two pieces of split skin. When dry, trim the edges, and preserve in a bottle or other closed receptacle.

Incense

1.	Storax	2½ oz.
	Benzoin	12 ,,
	Thus	2½ ,,
2.	Storax	2 oz.
	Benzoin	4 ,,
	Cascarilla	½ ,,
	Sandalwood	½ ,,
	Thus	1 ,,

Incense Paper, or Ribbon

Soak white unsized paper in the following mixture, and hang up to dry—

Potassium Nitrate	1 oz.
Mucilage of Acacia	2 fl. dr.
Distilled Water	1 pint

When dry, cut into strips, and again immerse in one of the following—

(*a*) Siam Benzoin,
Cascarilla . . of each 1 oz.
Rectified Spirit . . . 10 fl. oz.

(*b*) Siam Benzoin . . . 1 oz.
Olibanum . . . . 30 gr.
Storax . . . . 30 ,,
Oil of Cinnamon,
Oil of Clove,
Oil of Bergamot . of each 5 min.
Rectified Spirit . . . 10 fl. oz.

(*c*) Siam Benzoin . . . 1 oz.
Cascarilla . . . . 1 ,,
Oil of Sandalwood . . 10 min.
Oil of Cinnamon . . . 5 ,,
Oil of Clove . . . 5 ,,
Oil of Lavender . . . 5 ,,
Rectified Spirit . . . 10 fl. oz.

Fumigating Pastilles

1. Cascarilla . . . . 1 oz.
Benzoin . . . . 1 ,,
Camphor . . . . 1 dr.
Saltpetre . . . . 1 ,,
Charcoal . . . . 2 oz.
Ambergris . . . . 1 gr.
Musk . . . . 1 ,,

Powder finely, and make into a stiff paste with Mucilage of Tragacanth. Cut into cones and dry.

2. Cascarilla,
Sandalwood,
Benzoin . . . . 1 oz.
Tolu,
Thus . . of each 1 dr.
Saltpetre . . . . 80 gr.
Charcoal . . . . 2 oz.
Oil of Cinnamon . . . 5 min.
Oil of Clove . . . 5 ,,

Make into a paste, &c., as above.

3. Cascarilla,
Benzoin . . of each 1 oz.
Sandalwood,
Tolu,
Cloves,
Caraway . . of each 1 dr.
Otto of Rose . . . 5 min.
Oil of Lavender . . . 5 ,,
Charcoal . 2 oz.

Directions as above.

Perfuming of Programmes, &c.

Coumarin, Vanillin, Heliotropin	of each	10 gr.
Ionone		10 min.
Hyacinthin		5 ,,
Essence of Musk		30 ,,
Otto of Rose		5 ,,
Absolute Alcohol		1 fl. oz.

Distribute evenly on blotting-paper. Place this in a closed tin box with the programmes for twenty-four hours or so. It is almost inexhaustible.

Toilet Vinegars

1. Oil of Bergamot		40 min.
Oil of Lemon		30 ,,
Oil of Rosemary		20 ,,
Oil of Melissa		6 ,,
Oil of Clove, Oil of Lavender, Oil of Neroli	of each	4 min.
Glacial Acetic Acid		3 fl. oz.
Rectified Spirit		12 ,,
2. Lavender Water		2 fl. oz.
Eau de Cologne		17 ,,
Glacial Acetic Acid		1 ,,
3. Powdered Orris		8 oz.
Powdered Tonquin Beans		2 ,,
Lemon Peel		6 ,,
Vanilla		½ ,,
Yellow Sandalwood		3 ,,
Rosemary Flowers		1 ,,
Vetivert		½ ,,
Benzoin		4 ,,
Rectified Spirit		2 gals.

Macerate fourteen days, press, filter, and add—

Glacial Acetic Acid		10 fl. oz.
Oil of Melissa		1½ fl. dr.
Oil of Vetivert		½ ,,
Oil of Bergamot		4 ,,
Ess. Millefleurs		2 fl. oz.
4. Essence of Eau de Cologne		1 dr.
Glacial Acetic Acid	to	2 fl. oz.

5. Oil of Neroli,
   Oil of Lemon,
   Oil of Bergamot,
   Oil of Ylang Ylang,
   Oil of Clove,
   Oil of Lavender . of each 10 min.
   Glacial Acetic Acid . to 2 fl. oz.

6. Oil of Rosemary . . 15 min.
   Oil of Lavender . . 20 ,,
   Oil of Clove . . . 20 ,,
   Oil of Rose Geranium . . 10 ,,
   Oil of Sandalwood . . 5 ,,
   Rectified Spirit . . . 12 fl. dr.
   Glacial Acetic Acid . to 2 fl. oz.

PART VII

ANALYSIS

URINE ANALYSIS

Normal Urine is of a yellowish-brown colour which varies in intensity, but may be modified when certain drugs have been swallowed. The specific gravity ranges from 1·015 to 1·025. All examinations should be made on a sample taken from the bulked excretion during twenty-four hours. A healthy man passes about fifty fluid ounces in this time, of which some 4 per cent. is solid matter.

1. **The appearance** should be carefully noted. Any turbidity may be due to **URATES** (*dissolving on warming*), **PHOSPHATES** (*soluble in Acetic Acid*), **MUCUS, BLOOD,** or **PUS.** When blood is excreted by the kidneys the urine presents a brownish-red smoky appearance, but when derived from the bladder, urethra, &c., the urine may be brightly coloured. **URIC ACID,** when present in any quantity, may appear as a brown film on the surface, or may form a deposit something like Cayenne Pepper. It is only slightly soluble in boiling water, but readily dissolves on warming with Solution of Potash. Urine containing much **PUS** is turbid from the presence of suspended corpuscles.

2. **Specific Gravity** is taken at 60° F. (15·5° C.). In albuminuria the specific gravity falls to 1·005, while in diabetes it may rise to 1·050. Specific gravities are generally taken with a small hydrometer known as the *urinometer*, but where great accuracy is required recourse should be had to the specific gravity bottle.

3. **Reaction.**—The behaviour with litmus paper is noted. Normal urine is faintly acid, but in warm weather it soon becomes alkaline owing to decomposition of the urea into ammonia compounds.

4. **Detection of Albumin.**—(*a*) Make a few cubic centimetres slightly alkaline with Ammonia, filter, and divide into two portions, to one of which add a few drops of Acetic Acid and boil. Traces of albumin appear as a faint cloud, which is rendered more evident by

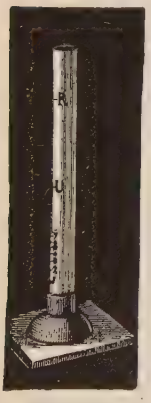
comparing with the reserved portion; larger quantities show as flocks or coagula. Albumoses or proteoses may be precipitated by the acid, but redissolve on warming.

(*b*) Filter a few cubic centimetres of urine, and add an equal quantity of Esbach's Solution—

Picric Acid	. . .	10 parts
Citric Acid	. . .	20 ,,
Distilled Water to	.	1000 ,,

This produces an immediate precipitate if albumin is present. *Peptones*, which may be precipitated, redissolve on heating; albumin does not.

This reaction with Esbach's Solution is made use of to give an *approximate determination* of the amount of albumin present. The filtered urine is poured into a special graduated tube, called an *albuminometer*, to the mark U, and filled to mark R with the test solution. The rubber cork having been inserted, the contents are gently mixed, anything like violent agitation being avoided. The tube is set aside for twenty-four hours in an upright position and the height of the precipitate read off. The figures represent *parts per thousand*. If over five parts per thousand of albumin are present, the urine should be previously diluted with an equal volume of water.



Esbach's Albuminometer.

The presence of *Albumoses*, *Proteoses*, or *Peptones* should be confirmed by the *biuret reaction*.

To 5 c.c. of filtered urine add *one drop* of the Copper solution of Fehling's test, mix, and add 5 c.c. of the alkaline solution. Mix. *Albumoses* or *Proteoses* give a rose-red colour. *Peptones* also give this reaction, but they are not coagulable by dilute acid.

Detection of Sugar.—The presence of sugar in urine may indicate diabetes or glycosuria. *Minute quantities* appear to be always present even in health, but the amount is too small to be detected by ordinary clinical tests. If albumin is present, the urine should be boiled and filtered before applying the following.

(*a*) *Fehling's Test.*—Boil a few cubic centimetres of the test solution, add an equal volume of the sample, mix, and heat to boiling point again. If sugar is present, a red or yellowish-red precipitate of Cuprous Oxide will be thrown down. A rose-red coloration without a pre-

cipitate probably indicates proteoses, albumoses, or peptones (*v. ant.*).

(*b*) *Johnson's Test.*—Five cubic centimetres of urine is mixed with an equal volume of saturated Picric Acid solution and 2 c.c. of Solution of Potash, and heated to boiling. If sugar is absent, the liquid deepens in colour, but is transparent when held against the light ; if present, the colour becomes so intense as to be quite opaque.

Determination of the Sugar.—This may be conveniently and accurately performed by

(*a*) Gerrard and Allen's Cyano-Cupric process ; or
(*b*) Johnson's method ; or
(*c*) Pavy's modification of Fehling's process.

(*a*) *Gerrard and Allen's Process.*—Filter the urine and dilute 10 volumes with 90 volumes of distilled water. Ten cubic centimetres of *freshly mixed* Fehling's Solution is diluted with 40 c.c. water, and heated in a porcelain dish to 212° F. A 5 per cent. (approximate) solution of pure Potassium Cyanide is then added until the blue colour very nearly disappears. Another 10 c.c. of Fehling's Solution is added, and the diluted urine run in from a burette until the blue colour just disappears. It is absolutely necessary to keep the mixture boiling from start to finish, and stir constantly.

The volume of urine required to reduce the second 10 *c.c. of Fehling's Solution contains* 0·05 *gramme of sugar reckoned as glucose.*

NOTE.—The blue colour returns on standing.

(*b*) *Johnson's Method.*—The standard solution for matching is made as follows—

Solution of Ferric Chloride 1·42	1 c.c.	
Glacial Acetic Acid 1·058 .	4 ,,	
Solution of Ammonia ·959 .	2 ,,	
Distilled Water to produce .	26 ,,	Mix.

Take of—

Sample to be tested . .	4 c.c.
Solution of Potash, B.P. .	2 ,,
Saturated Solution of Picric Acid	9 ,,

Heat to boiling in a long test tube, keep boiling for exactly one minute, cool, and make up to 15 c.c. with water. If the colour is now the same as that of the

standard or paler, the urine is either free from sugar or contains less than 0·2 per cent. (1 gr. in 1 fl. oz.). If darker than the *standard*, dilute it with distilled water until the colours are identical. Each dilution above 1 represents 0·2 per cent. glucose (or 1 gr. per fl. oz.). Thus—1 part diluted to 5 parts would represent 4 gr. per fl. oz.

If the urine contains over 5 gr. per fl. oz., it should be diluted with water, as the results are untrustworthy in concentrated samples.

(*c*) *Pavy's Method*—

Pavy's Solution (10 *c.c.* = 0·005 *gramme glucose*)

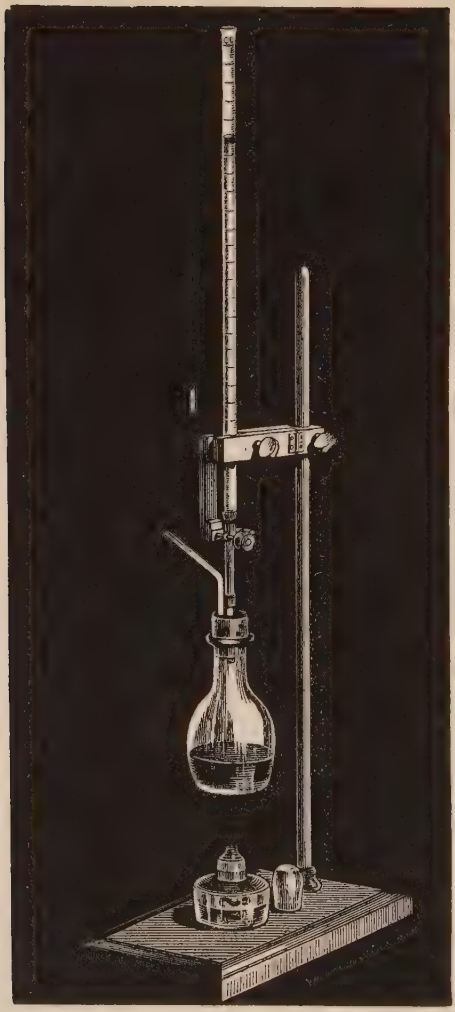
Freshly mixed Fehling's Solution	120 c.c.
Solution of Ammonia ·891 .	300 ,,
Solution of Caustic Soda 1·137	400 ,,
Distilled Water . . to	1000 ,,

Dilute 10 c.c. urine with 90 c.c. of 10 per cent. Ammonia Solution, and filter. Mix 20 c.c. Pavy's Solution (= 0·01 gramme glucose) with an equal volume of water, and place in a 250 c.c. flask fitted with rubber stopper pierced with two holes. The nozzle of a burette filled with the diluted urine is made to protrude through one hole ; through the second hole is passed a bent tube, to which is attached a length of rubber tubing to carry away the ammoniacal fumes given off during titration. Bring the contents of the flask to the boil, and keep boiling while the urine is cautiously run in until the blue colour is just discharged.

Three titrations should be made, and the mean reading taken, when $\frac{100 \times 10 \times 0{\cdot}01}{\text{c.c. used}}$ = percentage of glucose present in the *original* urine. An allowance of 0·2 per cent., equal to $\frac{3}{4}$ gr. per oz., may be made for the reducing action of the creatine, creatinine, and other bodies normally present in urine.

By Polariscope.—When an exact determination of sugar is required the urine should be examined in a polariscope. If less than 1·5 per cent. of sugar is present the urine must be concentrated. *Process :* Take 50 c.c. of the specimen, add 5 c.c. Liquor Plumbi Subacetatis, B.P., and a little animal Charcoal. Shake and filter. Take reading in 200 millimetre tube at 16° C. Reading on sugar scale × 1·1 × 0·32865 = per cent. glucose.

Of the exact methods this is by far the most rapid, as the solution filters without trouble.

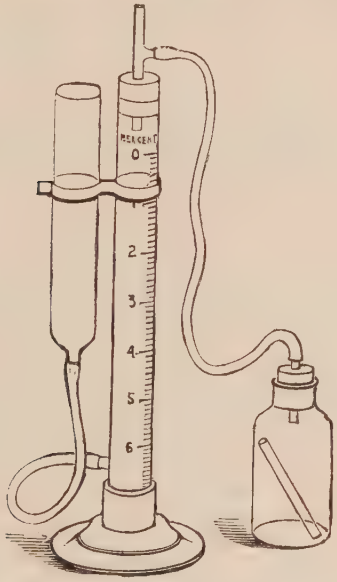


Apparatus arranged for Sugar Determination by Pavy's Method.

Determination of Urea.—This is best performed by the Sodium Hypobromite method, which depends on the liberation of Nitrogen according to the following equation:

$$CO(NH_2)_2 + 3NaBrO = 3NaBr + CO_2 + 2H_2O + N_2.$$

The apparatus devised by Gerrard is that generally employed. Water is poured into the reservoir until it



Gerrard's Ureameter.

reaches the zero line in the measuring tube; 25 c.c. freshly prepared Sodium Hypobromite solution is introduced into the bottle, and 5 c.c. of urine into the little tube. The latter is then carefully placed in the bottle. The rubber corks, &c., are fixed securely. If the water-level does not stand at zero, the pinch-cock is opened to relieve the air-pressure. The bottle is now inclined and gently shaken, so that the urine runs out of the tube into the Hypobromite, effervescence ensues, and the evolved Nitrogen forces the water from the measuring tube into the reservoir. The reservoir is now lowered until the

water levels correspond, and the apparatus left until the normal temperature is regained.

The instrument is graduated so as to indicate percentages of urea. Normal urine contains from 2 to 3 per cent. urea. The volume of gas need not be corrected to N.T.P., as the results at best are only approximate.

Sodium Hypobromite Solution

(*a*) Soda Solution

Caustic Soda . . .	100 grammes
Distilled Water . . .	250 c.c.

Dissolve and preserve.

Take 23 c.c. Solution (*a*) and 2·2 c.c. Bromine. Mix. This gives the exact quantity for one urea determination.

Instead of using Gerrard's ureameter an ordinary nitrometer may be employed. Using the above quantities, each cubic centimetre of Nitrogen evolved represents 0·0029 gramme urea.

Detection of Bile.—(*a*) *Gmelin's Test.*—Filter some of the urine through a white filter-paper; allow to become nearly dry; spread out on a white tile, and apply 1 drop of Nitric Acid (containing Nitrous Acid) to the centre. If bile is present, zones of colour, green, violet, red, and yellow, appear.

(*b*) *Pettenkofer's Test.*—To about 5 c.c. urine in a test tube add cautiously about 2 c.c. strong Sulphuric Acid, *cooling the tube* meanwhile in a freezing mixture. A pinch of cane sugar is then added, well mixed, and another 2 c.c. Sulphuric Acid poured in. As the temperature rises a reddish violet coloration is produced if bile salts are present.

(*c*) *Oliver's Test*—

Beef Peptone . . .	2·00
Salicylic Acid . . .	0·25
Acetic Acid 33 per cent. .	2·00
Distilled Water to . .	200·00

Dissolve and filter perfectly bright through Kieselguhr. Dilute the urine to specific gravity 1·008, filter bright with Kieselguhr. To 1 c.c. of this diluted urine add 3 c.c. of the reagent. If bile salts are present, an opalescence appears, which is more or less distinct according to the quantity.

Detection of Blood.—Under certain conditions the presence of blood can only be demonstrated by means of the spectroscope—an ordinary direct-vision instrument being employed.

Day's Test.—To a few cubic centimetres of the sample add an equal volume of fresh Tincture of Guaiacum (made from unoxidised resin) and Ethereal Solution of Peroxide of Hydrogen. Blood gives a fine blue colour, but so do many other substances, so that the test is unreliable.

Heller's Test.—In some cases of hæmoglobinuria, if the urine is alkalised with Caustic Soda solution and boiled, a bottle-green coloration is produced and a brownish-red precipitate thrown down.

The *Hæmin Test* may also be tried. Centrifuge some of the urine, and place the deposit on a microscopic slide with a few grains of Sodium Chloride. Evaporate to dryness over a water bath. Add a drop of Glacial Acetic Acid, stir, and warm. If blood is present, microscopic reddish-brown plates of hæmin separate on cooling.

Determination of Uric Acid (*Hopkin's Process*).

Urine . . .	100 c.c.
Ammonium Chloride .	30 grammes

Dissolve and neutralise with Ammonia. Set aside for Acid Ammonium Urate to separate. Collect on filter and wash with saturated solution Ammonium Sulphate. Rinse with 100 c.c. water into flask, add 20 c.c. Sulphuric Acid. Warm to 60° C., and titrate with $\frac{N}{20}$ Potassium Permanganate; 1 c.c. = 0·00375 gramme uric acid.

Normal urines contain about 0·05 per cent.

Chemical Examination of the Deposit.

Warm a little of the deposit (in the urine)	*Urates dissolve.*
Add Acetic Acid . . .	*Phosphates dissolve.*
If still insoluble, add Hydrochloric Acid	*Oxalates dissolve.*
If still insoluble, the deposit may consist of Uric Acid. Add to a fresh sample Caustic Potash .	*Uric Acid dissolves* (confirm by Murexid test).

Microscopical Examination of the Deposit.—Allow the urine to stand for a short time; pour off the supernatant liquid, and transfer most of the deposit to a centrifuge tube. Place in a centrifuge and whirl. Pour off the liquid and examine the deposit under a $\frac{1}{4}$-inch objective.

[METHOD OF DRAWING UP REPORT.]

URINE ANALYSIS REPORT.

Specimen marked H.G. 24 hours' sample.

CHEMICAL EXAMINATION.

Appearance	*Slightly turbid.*
Reaction	*Acid.*
Sp. Gravity	1·029.
Albumin	*Trace.*
Sugar	1·22 *per cent.*
Urea	*Normal.*
Uric Acid	
Acetone	*Absent.*
Phosphates as P_2O_5	

MICROSCOPICAL EXAMINATION.

Blood	*Absent.*
Pus	*Present in small amount.*
Casts	*Absent.*
Epithelium	*Normal.*
Crystals	*Uric Acid (few).*
	Oxalates (few).

Quantity of Urine passed in 24 hours was 51 fl. oz.

Detection of Tubercle Bacilli in Urine.—1. Add to the specimen sufficient liquefied Carbolic Acid to make 5 per cent. solution. Shake vigorously, and pour into a conical glass to separate. Reject the supernatant liquid, and transfer as much of the deposit as possible to a centrifuge tube. Whirl; pour off the liquid.

2. Prepare *thin* smears on cover-slips, and treat exactly as described under 'Sputum.'

Detection of Gonococci.—1. Obtain a deposit as above. Prepare thin smears on cover-slips; dry in hot air; pass twice through flame.

2. Clear for two minutes in 20 per cent. Acetic Acid; wash in Distilled Water and dry.

3. Stain with $\frac{1}{2}$ per cent. Eosin in 50 per cent. Alcohol. Wash in Distilled Water; dry; pass through flame.

4. Stain with Löffler's Methylene Blue; wash, dry, and mount in Xylol Balsam. Examine under $\frac{1}{12}$-inch oil-immersion.

EXAMINATION OF SPUTUM FOR TUBERCLE BACILLI

1. Shake the sputum with twice its volume of 5 per cent. Carbolic Solution until disintegrated. Allow to separate in a conical glass. Transfer as much of the deposit as possible to a centrifuge tube, and whirl.

Prepare *thin* smears from the deposit, dry in hot air, and pass three times through flame.

2. Wash for a minute or two in equal parts of Alcohol and Ether, dry, and pass through flame.

3. Stain for two minutes with Carbol Fuchsin; wash in water; decolourise with 25 per cent. HCl.

4. Wash in 60 per cent. Alcohol until no more stain comes away. Wash in Distilled Water, dry, and pass through flame.

5. Stain in Löffler's Methylene Blue for ten seconds. Wash in water; dry and pass through flame.

6. Mount in Xylol Balsam and examine under $\frac{1}{12}$-inch oil-immersion.

EXAMINATION OF HAIR FOR RINGWORM

1. Wash in equal parts of Alcohol and Ether. Dry.

2. Stain in Alcoholic Gentian Violet (a few drops in saturated Aniline Water) for five minutes.

3. Transfer to Gram's Iodine Solution for five minutes. Clear in Aniline.

4. Dip for one or two seconds in mixture of Nitric Acid 1 part, Aniline 2 parts.

5. Soak in Aniline until nearly clear.

6. Clear in equal parts of Xylol and Phenol.

7. Drain and mount in Xylol Balsam.

Examine under $\frac{1}{4}$-inch or $\frac{1}{6}$-inch.

WATER ANALYSIS

Total Solids. *Method.*—Place 70 c.c. of the water in a platinum dish and evaporate over a water bath to dryness. *The weight in milligrammes represents grains per gallon.*

Heat the dish to redness and note the odour. If nitrogenous, it is unfavourable.

Chlorine.

Standard Solution. (1 c.c. = 0·001 Cl.) { Pure recrystallised Argentic Nitrate 4·789 grammes. Distilled Water to 1,000 c.c.

Indicator.—5 per cent. solution of recrystallised Potassium Chromate.

Method.—Place 70 c.c. of the water in a white porcelain dish, add 2 drops of the indicator, and run in Silver solution from a burette until a faint permanent change of colour is discernible. Stir constantly.

Each cubic centimetre of standard $AgNO_3$ *Solution = 1 grain of Chlorine per gallon.*

Hardness. *Standard Hardness.*—Powdered Marble 1 gramme. Dissolve in the smallest possible quantity of Hydrochloric Acid, neutralise with Ammonia, heat to dryness on water bath ; add Distilled Water to produce 1,000 c.c.

Standard Soap Solution

Pure Castile Soap from Olive Oil . . . . . 10 grammes
Alcohol ·950 to produce . 1,000 c.c.

Adjust the Solution so that 1 c.c. = 1 c.c. standard hardness, or use factor for adjustment.

Method.—Place 70 c.c. of the water in stoppered flask or bottle holding 200 c.c., and run in Soap solution until lather produced after shaking persists for one minute.

Each cubic centimetre of Soap solution used (not counting the first) = grains of hardness per gallon.

Nitrogen as Nitrates. *Method.*—Place a piece of Zinc-foil about 4 inches by $1\frac{1}{2}$ inch in a 6-oz. wide-mouth stoppered bottle. Cover with water, add a few drops of Caustic

Potash solution, and shake well for a minute. Pour off the liquid and rinse well with Distilled Water. Cover the Zinc with solution of Cupric Sulphate (about 2 to 3 per cent.). After about two minutes pour away the solution and rinse the *Zinc-Copper-couple* with Distilled Water, and pour off and drain.

Add 70 c.c. of the water to be examined, tie down the stopper, and place the bottle in a fairly warm place overnight. Next day wash contents with ammonia-free water into ammonia-free distilling apparatus and distil. Collect in fractions of 50 c.c. Nesslerise.

Each cubic centimetre of weaker Ammonium Chloride solution used in the matching is equivalent to 0·00823 *grain N per gallon as Nitrates.*

Subtract N due to saline Ammonia. *See* later.

Saline Ammonia.

Alkaline Potassium Permanganate Solution

Caustic Potash . . .	200 grammes
Potassium Permanganate .	8 ,,
Distilled Water .	about 1,500 c.c. or more

Boil rapidly down to about 1,000 c.c. This leaves the solution nearly Ammonia-free.

Sodium Carbonate Solution

Pure Sodium Carbonate .	200 grammes
Distilled Water .	about 1,500 c.c.

Boil rapidly down to about 1,000 c.c.

Method.—(*a*) Place 250 c.c. Distilled Water in 1,000 c.c. flask with few drops Na_2CO_3 solution. Distil rapidly until ammonia-free. Do not empty.

Add 500 c.c. of the water to be examined, distil, collect fractions of 50 c.c. Nesslerise.

Each cubic centimetre of weaker Ammonium Chloride solution used in matching = 0·0014 *grain of saline Ammonia per gallon.*

(*b*) Add to contents of flask 50 c.c. Alkaline Permanganate solution (previously boiled with Distilled Water until ammonia-free) and again distil. Collect in fractions of 50 c.c. and Nesslerise as before.

Each cubic centimetre of weaker Ammonium Chloride solution used in matching = 0·0014 *grain of albuminoid Ammonia per gallon.*

Stronger *Ammonium Chloride Solution*

Pure Ammonium Chloride .	3·146 grammes
Distilled Water (ammonia-free) . . .	to 1,000 c.c.

Weaker *Ammonium Chloride Solution*

Stronger Solution . .	10 c.c.
Distilled Water (ammonia-free) to . .	to 1,000 c.c.

Each cubic centimetre of this solution = 0·00001 NH_3.

Nitrites (*Griess' Test*).

Method.—Place 50 c.c. of the sample in clean porcelain dish, add pinch each of Sulphanilic Acid, Naphthylamine Hydrochloride, and one or two drops Concentrated Hydrochloric Acid. Stir. Pink colour = Nitrites.

Oxygen Consumed.—*Method.*

Standard Solution.—Potassium Permanganate 0·395 gramme in 1,000 c.c.

Potassium Iodide Solution.—1 in 10.

Dilute Sulphuric Acid.—Pure H_2SO_4 1 part by volume. Distilled Water 3 parts by volume.

Drop in Potassium Permanganate Solution until faint pink colour remains after standing at about 25° C. for four hours.

' *Hypo* ' *Solution.*—1 gramme of ' Hypo ' in 1,000 c.c.

Starch Solution.—Boil 1 gramme Starch in 500 c.c. water for five minutes. Cool and filter.

Method.—Place 250 c.c. sample in stoppered flask or bottle, add 10 c.c. of the Acid and 10 c.c. of the standard Permanganate solution (more if required). Stand at temperature of 16° C. for three hours. Make a blank with *pure* Distilled Water, which stand under same conditions. At expiration of time add few drops KI solution to each, and titrate with the ' Hypo ' Solution, using starch as indicator.

Then $\frac{\text{Blank} - \text{Sample} \times 0{\cdot}28}{\text{Blank}}$ = *grains of Oxygen consumed per gallon.*

Poisonous Metals. *Method.*—Place 70 c.c. of the water in a clean porcelain basin, and add one drop Ammonium Sulphydrate solution. If Copper or Lead be present, darkening ensues *which is not removed on adding one drop concentrated* H.Cl.

Method of Drawing up Report.

Sample marked H.T. Scullery well, 20 ft. deep, brick lined. Drain passes within 10 ft.

	Grains per gal.*
Total Solids	39·82
Chlorine	5·90
Total Hardness	16·40
Nitrogen as Nitrates	1·72
Nitrites	Absent
Saline Ammonia	0·0210
Albuminoid Ammonia	0·0420
Oxygen consumed	0·1500
Poisonous Metals	Absent

Sample was slightly turbid and developed unpleasant odour on warming.

Remarks.—This sample is evidently polluted with sewage, and is unfit for human consumption.

* To convert grains per gallon into parts per million ÷ 0·07.
To convert grains per gallon into parts per 100,000 ÷ 0·7.

MILK ANALYSIS

(*Rapid Method*)

Total Solids.—Evaporate 5 grammes over water bath to constant weight without stirring. Weight × 20 = per cent. total solids.

Ash.—Ignite product of above at dull red heat to constant weight. Weight × 20 = per cent. ash.

Fat. *Gerber Process.*—Milk tubes are about 30 c.c. capacity. Graduations on neck = 0·1 per cent. fat when 15 c.c. milk operated upon.

Method.—Introduce into tube successively—

Milk		15 c.c.
Amylic Alcohol Strong HCl	equal parts.	3 ,,

Shake gently and add H_2SO_4 (1·825) nearly to neck. Mix by gently rotating. Fill to zero with water and H_2SO_4 equal parts, *freshly mixed* for each test; centrifuge. Read off with callipers. Perform in duplicate. If fat below 3 per cent., check by extraction with Ether.

Non-Fatty Solids are obtained by deducting fat from total solids.

(*Richmond's Method*)

Instead of the above, which gives nearly accurate and concordant results, an *approximation* may be made by determining total solids and specific gravity; thus, specific gravity = 1·032 and total solids = 12·2. Then adjust arrow on Richmond slide rule to 12·2; immediately above will appear the fat, 3·5 per cent. Or, Rich-

mond's formula may be applied. Fat = 0·859 × total solids — 0·2186 × last 2 units of gravity.

Example.—Sample gives total solids 12·2 ; specific gravity 1·032.

(0·859 × 12·2) — (0·2186 × 32) = 3·48 per cent. Fat.

EXAMINATION OF SPIRIT OF NITROUS ETHER, B.P.,

and Calculation of Ethyl Nitrite present

Fill nitrometer with brine.

Lower control tube and run in successively—

Sweet Nitre . . .	5 c.c. (exact)
10 per cent. Potassium Iodide Solution . . .	5 ,,
Dilute Sulphuric Acid .	5 ,,

Take care no air finds entrance. Grease the tap with vaseline. Shake ; adjust control tube ; stand ten minutes to cool, and take reading. Then,

$$C_2H_5NO_2 + KI + H_2SO_4 = C_2H_5OH + KHSO_4 + I + NO$$

1 c.c. NO at N.T.P. = 0·00127 gramme.

Example.—5 c.c. sample yielded 30 c.c. NO at 16·5° C. and 756 mm. pressure.

(*a*) $\frac{(273 + 15{\cdot}5) \times 756 \times 30}{(273 + 16{\cdot}5) \times 760}$ = 29·8 c.c. at N.T.P.

(*b*) 0·00127 × 29·8 = 0·037846 gramme NO = 2·17 per cent. weight in weight Ethyl nitrite.

The B.P. requires Spirit of Nitrous Ether to yield at 15·5° C. and 760 mm. pressure not less than 4 and not more than 7 volumes of nitric oxide, equivalent to not less than 1·52 or more than 2·66 parts by weight of ethyl nitrite in 100 parts by weight of the spirit.

Useful data in nitrometer analysis :

1 c.c. NO at N.T.P. =	0·00281	gramme	HNO_3
	0·00241	,,	N_2O_5
	0·00450	,,	KNO_3
	0·003344	,,	$C_2H_5NO_2$
	0·0026	,,	CH_4N_2O
1 c.c. CO_2 at N.T.P. =	0·0042	,,	$(NH_4)_2CO_3$
	0·001967	,,	CO_2

PART VIII

TABLES

SYNONYMS

Acetylphenylamine	*Acetanilide*
Acid, Borussic	*Acid Hydrocyanic Dilute*
Acid, Carbazotic	*Picric Acid*
Acid Elixir of Vitriol	*Acid. Sulph. Arom.*
Acid of Amber	*Succinic Acid*
Acid of Lemons	*Citric Acid*
Acid, Phenic	*Carbolic Acid*
Acid of Sugar	*Oxalic Acid*
Acidum Azoticum	*Nitric Acid*
Acidum Limonorum	*Citric Acid*
Acidum Ossium	*Phosphoric Acid*
Acid. Scyto-depsicum	*Tannic Acid*
Adeps Anserinus	*Goose Grease*
Adeps Gadi	*Cod Liver Oil*
Adeps Mineralis	*Soft Paraffin*
Adeps Myristicæ	*Expressed Oil of Nutmeg*
Adeps Ovillus	*Mutton Suet*
Adepsine	*Soft Paraffin*
Adepsine Oil	*Liquid Paraffin*
Adragante	*Tragacanth*
Ægyptiacum	*Lin. Æruginis*
Æris Flores	*Copper Acetate*
Ærosus Lapis	*Calamine*
Ærugo	*Verdigris*
Æs	*Copper*
Æthiops Absorbens	*Hydrarg. cum Creta*
Æthiops Antimoniales	*A Mixture of Black Antimony and Mercury*
Æthiops Martialis	*Black Iron Oxide*
Æthiops Mercurialis	*Hydrarg. Sulph. cum Sulph.*
Æthiops Mineral	*Hydrarg. Sulph. cum Sulph.*
Ague Salt	*Quinine Sulphate*
Albocarbon	*Naphthalin*
Alcohol Sulphuris	*Carbon Disulphide*
Alcohol of Vinegar	*Glacial Acetic Acid*
Alcoölat	*Alcohol*

Alegar. . . .	*Vinegar*
Alembroth Salt . .	*Ammonio-Mercuric Chloride*
Algaroth's Powder .	*Antimony Oxychloride*
Alum Rupeum . .	*Alum with Ferric Oxide*
Alumen Plumosum .	*Asbestos*
Ambretta Seeds . .	*Musk Seeds*
Amianthus . . .	*Asbestos*
Amidum . . .	*Starch*
Amphion . . .	*Opium*
Analgesine . . .	*Phenazone*
Animal Glycerin . .	*Neatsfoot Oil*
Animal Oil . . .	*Bone Oil*
Animi Resin . .	*Copal*
Annidalin . . .	*Aristol*
Antimony, Diaphoretic .	*Antimony Oxide*
Antlia Gastrica . .	*Stomach Pump*
Aqua Ammoniæ . .	*Liquor Ammoniæ*
Aqua Coloniensis . .	*Eau de Cologne*
Aqua Dulcis . .	*Chloroform Water*
Aqua Flava. . .	*Lotio Hydrarg. Flav.*
Aqua Fortis. . .	*Nitric Acid*
Aqua Naphæ . .	*Orange Flower Water*
Aqua Nigra . . .	*Lotio Hydrarg. Nig.*
Aqua Oxygenata . .	*Liq. Hydrogen Perox.*
Aqua Raphani Co. .	*Sp. Armoraciæ Co.*
Aqua Regia . . .	*Strong Nitro-hydrochloric Acid*
Aqua Saturni . .	*Liq. Plumbi Subacet. Dil.*
Aqua Vitæ . . .	*Brandy*
Aquila Alba. . .	*Calomel*
Argentum Vivum . .	*Mercury*
Argol	*Crude Cream of Tartar*
Aromatic Confection .	*Pulv. Cretæ Aromat.*
Asa Dulcis . . .	*Benzoin*
Aseptic Acid . .	*Boric Acid*
Atramentum . .	*Black Ink*
Aurum Musivum . .	*Tin Sulphide* (*Mosaic Gold*)
Axungia . . .	*Lard*
Azotic Acid . . .	*Nitric Acid*
Baker's Salt. . .	*Ammon. Carb.*
Balm Drops. . .	*Friar's Balsam*
Balm of Life . .	*Dec. Aloes Co.*
Balsam, Friar's . .	*Comp. Tincture of Benzoin*
Balsam, Persian . .	*Comp. Tincture of Benzoin*
Balsam of Life . .	*Dec. Aloes Co.*
Balsam of Soap . .	*Lin. Saponis*
Balsam of Sulphur .	*Sulphurated Oil*
Balsam, Traumatic .	*Tr. Benz. Co.*
Balsam of Turpentine .	*Dutch Drops*
Balsamicum. . .	*Friar's Balsam*
Basilicon Ointment .	*Resin Ointment*
Baume de Vie . .	*Dec. Aloes Co.*

Benzene	*Coal Tar distillate*
Benzin	*Petroleum distillate*
Benzol	*Synonym for Benzene*
Betel Nut	*Areca Nut*
Bhang	*Indian Hemp*
Bigarade Oil	*Ol. Aurant. Amar.*
Bitter Apple	*Colocynth*
Bitter Chips	*Quassia*
Black Draught	*Mist. Sennæ Co.*
Black Drop	*A strong sol. of Opium (U.S.P. 1851)*
Black Gip	*Indian Ink*
Black Jack	*Black Draught*
Black Jam	*Confection of Senna*
Black Strap	*Black Draught*
Black Tincture	*Tinct. Aloes et Myrrh.*
Blaud's Pill	*Pil. Ferri*
Blue, Berlin	*Prussian Blue*
Blue Butter	*Ung. Hydrarg. Mit.*
Blue Ointment	*Ung. Hydrarg.*
Blue Pill	*Pil. Hydrarg.*
Blue Stone	*Cupric Sulphate*
Blue Unction	*Ung. Hydrarg. Mit.*
Bole Armenian	*Ferric Oxide*
Bone Ash	*Calcium Phosphate*
Bone Black	*Animal Charcoal*
Brandy Bitters	*Tr. Gent. Co.*
Brandy Mint	*Peppermint*
Brassium	*Malt*
British Gum	*Dextrin*
Butter of Antimony	*Liq. Antim. Chlor.*
Butter of Paraffin	*Soft Paraffin*
Butter of Zinc	*Zinc Chloride*
Butter Powder	*Sodium Bicarbonate*
Butter of Sulphur	*Precipitated Sulphur*
Byne	*Malt*
Cabbage Oil	*Oleum Viride*
Cacao Butter	*Oil of Theobroma*
Calisaya Bark	*Yellow Cinchona Bark*
Camphor Julep	*Camphor Water*
Caramel	*Burnt Sugar*
Carbasus	*Gauze*
Carron Oil	*Linseed Oil and Lime Water*
Cera Sigillita	*Sealing Wax*
Ceratum Galeni	*Cold Cream*
Ceresin	*A kind of Hard Paraffin*
Cerussa	*Lead Carbonate*
Charpie	*Lint*
Chemical Food	*Syr. Ferri Phosp. Co.*
Chinese White	*Zinc Oxide*
Chinium	*Quinine*

Chymosin	*Pepsin*
Cinnabar	*Vermilion*
Cinnabar of Antimony	*Vermilion*
Citrine Ointment	*Ung. Hydrarg. Nitratis*
Colcothar	*Purple Ferric Oxide*
Colophony	*Resin*
Commander's Balsam	*Tinct. Benzoin. Co.*
Conf. Aromat.	*Pulv. Cretæ Aromat.*
Copperas	*Ferrous Sulphate (Impure)*
Cornu Cervi	*Hartshorn*
Corrosive Sublimate	*Mercuric Chloride*
Cosmetic Bismuth	*Bismuth Oxychloride*
Cosmetic Mercury	*Ammoniated Mercury*
Crabs' Eyes	*A Preparation of Calcium Carbonate*
Cramp Drops	*Sp. Ætheris Co.*
Cream of Tartar	*Potass. Tart. Acidus*
Cream of Tartar, Soluble	*Potassium Borotartrate*
Crocus Martis	*Colcothar (Purple Ferric Oxide)*
Crocus Saturni	*Red Lead*
Crow-Fig	*Nux Vomica*
Crystal Mineral	*Sal Prunella*
Cuca	*Coca*
Cutch	*Black Catechu*
Dactyli	*Dates*
Deadly Nightshade	*Belladonna*
Death's Herb	*Belladonna*
Devil's Apple	*Stramonium*
Devil's Dung	*Asafetida*
Diachylon Plaster	*Emp. Plumbi*
Dippel's Acid Elixir	*Acid. Sulph. Arom.*
Dippel's Oil	*Bone Oil*
Donovan's Solution	*Liq. Arsenii et Hydrargyri Iodidi*
Dover's Powder	*Pulv. Ipecac. Co.*
Draco Mitigatus	*Calomel*
Dragon's Blood	*Calamus Draco*
Dutch Drops	*Haarlem Oil*
Earth, Japan	*Catechu*
Earth Wax	*Ceresin*
Easton's Syrup	*Syr. Ferri Phosp. c. Quin. et Strych.*
Eau de Goudron	*Tar Water*
Eau de Javelle	*Sol. Potass. Chlorinat.*
Eau de Luce	*Tinct. Ammon. Co. P.L.*
Eau de Naphre	*Aq. Flor. Aurant.*
Eau de Surean	*Elderflower Water*
Eau de Vie	*Brandy*
Ebor Ustum	*Bone Black*
Elixir ad Longam Vitam	*Tr. Aloes Co.*
Elixir Asthmaticum	*Paregoric*

Elixir of Paregoric	*Tinct. Camph. Co.*
Elixir of Vitriol	*Acid. Sulph. Aromat.*
Ens Martis	*Ferri Ammon. Cit.*
Epsom Salt	*Magnesium Sulphate*
Essence of Mirbane	*Nitrobenzol*
Essence of Tar	*Creosote*
Essence of Viper	*Tinct. Cantharidis*
Extract of Lead	*Liq. Plumbi Subacet. Fort.*
Eyestones	*Crabs' Eyes*
Fæcula	*Starch*
Farina	*Flour*
Feck	*Methylated Spirit*
Feech	*Methylated Spirit*
Ferrugo	*Iron Rust*
Ferrum Limatum	*Iron Filings*
Ferrum Pomatum	*Iron Malate*
Fever Drops	*Tinct. Cinchon. Co.*
Fiddle Gum	*Tragacanth*
Flake White	*Lead Carbonate*
Flores Antimonii	*Antimony Sesquioxide*
Flores Benzoes	*Benzoic Acid*
Flores Bismuthi	*Bismuth Oxide*
Flores Zinci	*Zinc Oxide*
Flos Æruginis	*Copper Acetate*
Flos Salis	*Sodium Carbonate*
Flowers of Sulphur	*Sublimed Sulphur*
Flowers of Zinc	*Zinc Oxide*
Fluid Magnesia	*Liq. Magnes. Carb.*
Fossil Earth	*Kieselguhr*
Four Thieves' Vinegar	*Acid. Acetic. Arom.*
Fowler's Solution	*Liq. Arsenicalis*
Frankincense	*Olibanum*
French White	*Powdered Talc*
Friar's Balsam	*Tinct. Benzoin. Co.*
Fuligo	*Soot*
Furfur	*Bran*
Galena	*Lead Sulphide*
Galen's Cerate	*Cold Cream*
Gas Black	*Lampblack*
Gas Carbon	*Naphthalene*
Gas Salts	*Naphthalene*
Glass of Antimony	*Vitrified Antimony Oxide*
Glass Gall	*The scum formed on the surface of melting glass*
Glauber's Salt	*Sodium Sulphate*
Glonoin Sol.	*Liq. Trinitrini*
Goa Powder	*Araroba*
Golden Acorn	*Nutmeg*
Golden Ointment	*Ung. Hyd. Oxid. Flav.*
Golden Sulphur	*Antimon. Sulphurata*
Goulard's Extract	*Liq. Plumbi Fortis*

Goulard's Lotion	*Liq. Plumbi Subacet. Dil.*
Goulard's Powder	*Lead Acetate*
Goulard's Water	*Liq. Plumbi Dil.*
Grains of Paradise	*Melagueta Pepper*
Green Ointment	*Ung. Sambuci Virid.*
Green Vitriol	*Ferrous Sulphate (Impure)*
Grey Lotion	*Lotio. Hydrarg. Nig.*
Grey Ointment	*Ung. Hydrarg. Mite*
Grey Powder	*Hydrarg. c. Creta*
Gregory's Powder	*Pulv. Rhei Co.*
Griffith's Mixture	*Mist. Ferri Co.*
Guaza	*Indian Hemp*
Gum Dragon	*Tragacanth*
Gum Scorpionis	*Acacia*
Gunjah	*Indian Hemp*
Heberden's Ink	*Mist. Ferri Aromat.*
Hepar Sulphur	*Potassa Sulphurata*
Hiera Picra	*Pulv. Aloes cum Canella*
Hippo Wine	*Ipecacuanha Wine*
Hoffmann's Anodyne	*Sp. Ætheris Comp.*
Holy Bitter	*Hiera Picra*
Homberg's Phosphorus	*Calcium Chloride*
Homberg's Sedative Salt	*Boric Acid*
Honey Balsam	*Oxymel of Squill*
Horse Tincture	*Friar's Balsam*
Huile de Cade	*Juniper Tar Oil*
Huxham's Tincture	*Tinct. Cinchonæ Co.*
Ichthyocolla	*Isinglass*
Issue Peas	*Orange Berries*
James's Powder	*Said to be Pulv. Antimonialis*
Japan Earth	*Catechu*
Jesuit's Bark	*Cinchona*
Jesuit's Drops	*Tinct. Benz. Co.*
Jew's Pitch	*Asphaltum*
Kali Æratum	*Potassium Carbonate*
Kaolin	*China Clay*
Kefyr	*A fermented milk*
Kermes Mineral	*Sulphurated Antimony*
King's Yellow	*Antimony Sulphide*
Labarraque's Liquid	*Liq. Calcis Chlorinata*
Lamotte's Drops	*Tr. Ferri Perchlor. Æther.*
Lanain	*Adeps Lanæ Hyd.*
Lapis Baptista	*Talc*
Lapis Cæruleus	*Copper Sulphate*
Lapis Infernalis	*Silver Nitrate (Fused)*
Lapis Lazuli	*Ultramarine*
Lapis Smiridis	*Emery*
Laudanum	*Tinct. Opii*
Lavender Drops	*Tinct. Lavand. Co.*
Lemon Acid	*Citric Acid*
Lenitive Electuary	*Conf. Sennæ*

Leucænus	*White Wine*
Lignum Sanctum	*Guaiacum Wood*
Lignum Vitæ	*Guaiacum Wood*
Liquor Cornu Cervi	*Liquor Ammoniæ*
Liquor Donovani	See *Donovan's*
Liquor Potassæ Arsenitis	*Liquor Arsenicalis*
Liquor Seriparus	*Liquid Rennet*
Litharge	*Lead Oxide*
Liver of Sulphur	*Sulphurated Potash*
Long Life Balsam	*Friar's Balsam*
Lugol's Solution	*Liq. Iodi, B.P.* 1885
Lunar Caustic	*Nitrate of Silver*
Magisterium Coccionellæ	*Carmine*
Magistery of Bismuth	*Bismuth Oxynitrate*
Magistery of Sulphur	*Washed Sulphur*
Magnesia Alba	*Magnes. Carb. Pond.*
Magnesia Nigra	*Manganese Dioxide*
Marine Acid	*Hydrochloric Acid*
Marine Salt	*Sodium Chloride*
Massicot	*Lead Oxide ; Litharge*
Maw Seed	*Poppy Seed*
Medulla Bovis	*Beef Marrow*
Mercurius Dulcis	*Calomel*
Mica Panis	*Bread Crumb*
Microcosmic Salt	$Na(NH_4)HPO_4$
Milk of Sulphur	*Precipitated Sulphur*
Mindererus Spirit	*Liq. Ammon. Acet.*
Mineral, Æthiops	See *Æthiops*
Mineral Gum	*Soluble Glass*
Mineral, Kermes	See *Kermes*
Mineral Lard	*Soft Paraffin*
Mineral Oil	*Liquid Paraffin*
Mineral Pitch	*Asphalt*
Mineral, Turpeth	See *Turpeth*
Mineral Wax	*Ceresin*
Minium	*Red Lead*
Mistura Acaciæ	*Mucilage of Acacia*
Monsel's Salt	*Ferric Sub-Sulphate*
Moore's Ointment	*Resin Ointment*
Mosaic Gold	See *Aurum*
Muriatic Acid	*Hydrochloric Acid*
Natrium	*Sodium*
Natro-Kali Tartaricum	*Rochelle Salt*
Natron	*Sodium*
Neogale	*Fresh Milk*
Nitre	*Potassium Nitrate*
Oak Apples	*Galls*
Oil, Carron	See *Carron*
Oil of Dagget	*Oil of Birch Tar*
Oil, Dippel's	*Animal oil distilled from bones*
Oil of Kermes	*Syr. Rhœados*

Oil, Lund's	*A mixture of Almond and Castor Oils with 5 per cent. Phenol*
Oil of Mace	*Expressed Oil of Nutmeg*
Oil of Smoke	*Creosote*
Oil of Swallows	*Ol. Sambuci Virid.*
Oil of Tar	*Creosote*
Oil of Tartar	*Sol. of Potass. Carb.*
Oil of Vitriol	*Sulphuric Acid*
Ointment, Basilicon	See *Basilicon*
Ointment, Citrine	See *Citrine*
Ointment, Green	See *Green*
Oleum Anthos	*Oil of Rosemary*
Oleum Bubulum	*Neatsfoot Oil*
Oleum Cedræ	*Oil of Lemon*
Oleum Cocois	*Coco-nut Oil*
Oleum Napi	*Rape Oil*
Oleum Nervinum	*Neatsfoot Oil*
Oleum Palmæ Christi	*Castor Oil*
Oleum Petræ	*Crude Petroleum*
Oleum Portugallicum	*Oil of Bergamot*
Oleum Rusci	*Oil of Birch Tar*
Oleum Viride	*Ol. Sambuci Virid.*
Opodeldoc	*Lin. Saponis*
Orpiment	*Yellow Arsenic Sulphide (Native)*
Panacea Mercurialis	*Calomel*
Paregoric	*Tinct. Camphor. Co.*
Paris Green	*Copper Arsenite*
Passulæ	*Raisins*
Pearl White	*Bismuth Oxynitrate*
Persio	*Cudbear*
Phenic Acid	*Carbolic Acid*
Phenylic Acid	*Carbolic Acid*
Pill, Blaud's	*Pil. Ferri*
Pill, Christison's	*Pil. Coloc. et Hyoscyami*
Pill, Marshall Hall's	*Pil. Aloes Dil.*
Pil. Plummeri	*Pil. Hydrarg. Subchlor. Co.*
Pil. Rufi	*Pil. Aloes et Myrrhæ*
Pinguedo	*Lard*
Plasma	*Glycerin of Starch*
Pompeiian Ointment	*Ung. Sambuci Virid.*
Pompholix	*Zinc Oxide*
Precipitate, Red	*Hyd. Oxid. Rub.*
Precipitate, White	*Hyd. Ammoniatum*
Pulvis Aerophorus	*Seidlitz Powders*
Pulvis Jacobi Fict.	*Pulvis Antimonialis*
Putty Powder	*Tin Oxide*
Pyrænus	*Alcohol*
Raddle	*Red Ochre, Venetian Red*
Rangoon Oil	*Crude Petroleum Oil*

Ramenti Ferri	*Iron Filings*
Realgar	*Native Red Arsenic Sulphide*
Red Dominion Plaster	*Emp. Ferri*
Red Lavender Drops	*Tinct. Lavand. Co.*
Roche Alum	*Alum coloured with Ferric Oxide*
Rochelle Salt	*Soda Tartarata*
Roman Alum	*Roche Alum*
Roman Vitriol	*Cupric Sulphate*
Royal Powder	*Pulv. Scammon. Co.*
Rufus Pill	*Pil. Aloes et Myrrhæ*
Rupel Alum	*Roche Alum*
Sacred Bark	*Cascara Sagrada*
Sal Absinthii	*Potassium Bicarbonate*
Sal Acetosella	*Potassium Oxalate*
Sal Aeratus	*Potassium Carbonate*
Sal Alembroth	*Chloride of Ammonium and Mercury*
Sal Ammoniac	*Ammonium Chloride*
Sal Ammoniacum Martiale	*Iron Ammonium Chloride*
Sal Argentum	*Silver Nitrate*
Sal Benjamin	*Benzoic Acid*
Sal Catharticus Amarus	*Magnesium Sulphate*
Sal Chalybis	*Ferrous Sulphate*
Sal Cornu Cervi	*Ammon. Carb.*
Sal Diureticus	*Potassium Acetate*
Sal de Duobus	*Potassium Sulphate*
Sal Enixum	*Potassium Hydrogen Sulphate*
Sal Fossilis	*Common Salt*
Sal Fuliginis	*Ammonium Carbonate*
Sal Marinum	*Sea Salt ; Common Salt*
Sal Martis	*Ferrous Sulphate*
Sal Nitrum	*Saltpetre*
Sal Polychrestus	*Potassium Sulphate*
Sal Prunella	*Potassium Nitrate*
Sal Rupellensis	*Rochelle Salt*
Sal Saturni	*Lead Acetate*
Sal Sedativus (Homberg)	*Boric Acid*
Sal Tartari	*Potassium Carbonate*
Sal Volatile	*Ammonium Carbonate*
Salmiac	*Ammonium Chloride*
Salt, Herapath's	*Quinine Iodo-sulphate*
Salt of Lemon	*Potassium Oxalate (generally with some admixture as Cream of Tartar)*
Salt of Tartar	*Potassium Carbonate*
Salt of Wisdom	*Alembroth Salt*
Salt of Wormwood	*Potassium Carbonate*
Saltpetre	*Potassium Nitrate*
Salts	*Generally, Epsom Salt*

Schlippe's Salt	*Sodium Thio-antimonate*
Scotch Gin	*Sweet Spirit of Nitre*
Scott's Dressing	*Ung. Hydrarg. Co.*
Scott's Liniment	*Lin. Hydrarg.*
Sea Onion	*Squill*
Sedative Salt	*Boric Acid*
Soap Stone	*French Chalk*
Soldiers' Ointment	*Ung. Hydrarg. Mite*
Solution, Donovan's	See *Donovan's*
Solution, Fowler's	See *Fowler's*
Spanish White	*Bismuth Subnitrate*
Spirit Frumenti	*Whisky*
Spirit of Hartshorn	*Liquor Ammoniæ*
Sp. Lavand. Co.	*Tinct. Lavand. Co.*
Spirit, Mindererus	*Liq. Ammon. Acet.*
Spirit Sacchari	*Rum*
Spirit of Salt	*Muriatic Acid*
Spirit of Sulphur	*Sulphurous Acid*
Spirit of Tar	*Ol. Picis Rect.*
Spirit of Vinegar	*Dilute Acetic Acid*
Spirit Vini Gallici	*Brandy*
Steel Drops	*Tinct. Ferri Perchlor.*
Steel Mixture	*Mist. Ferri Co.*
Stone Black	*Animal Charcoal*
Stone Red	*Iron Oxide*
Sugar of Lead	*Lead Acetate*
Sulphur Auratum	*Antimony Sulphide*
Sulphur, Milk of	*Precipitated Sulphur*
Sulphur Nigrum	*Sulphur, Impure (Black)*
Sulphur Vivum	*Sulphur, Impure (Black)*
Swedish Balsam	*Friar's Balsam*
Talc	*French Chalk*
Tar Spirit	*Benzene*
Tartar Emetic	*Antim. Tart., B.P.*
Terra Cariosa	*Rotten Stone*
Terra Fullonica	*Fuller's Earth*
Terra Japonica	*Catechu*
Theriaca	*Treacle*
Tilly Drops	*Dutch Drops*
Tincal	*Native Borax*
Tinct. Meconii	*Tinct. Opii*
Tinct. Opii Camph.	*Tinct. Camph. Co.*
Tinct. Thebaici	*Tinct. Opii*
Tincture of Steel	*Tinct. Ferri Perchlor.*
Tinker's Salve	*Ung. Hydrarg. Mit.*
Tinkler's Salve	*Ung. Resinæ*
Toothache Seeds	*Sem. Hyoscyami*
Torrington's Drops	*Tinct. Benz. Co.*
Tous les Mois	*Canna Starch*
Traumatic Balsam	*Friar's Balsam*
Traumaticin	*Solution of Gutta Percha*

Troopers' Ointment	*Ung. Hydrarg. Mite*
Turner's Black	*Animal Charcoal*
Turner's Cerate	*Ung. Calaminæ*
Turnsole	*Litmus*
Turpeth Mineral	*Yellow Mercury Oxysulphate*
Tutty Powder	*Impure Zinc Oxide*
Unction, Blue	*Ung. Hydrarg. Mite*
Vallet's Pills	*Pil. Ferri, B.P.*
Vegetable Calomel	*Podophyllum Resin*
Vegetable Salt	*Potassium Oxalate*
Vegetable Sulphur	*Lycopodium*
Vegetable Wax	*Japan Wax*
Verdigris	*Cupric Oxyacetate*
Vermilion	*Red Mercury Sulphide*
Violet Root	*Orris Root*
Vitriol	*Sulphuric Acid*
Vitriol, Blue	*Cupric Sulphate*
Vitriol, Green	*Impure Ferrous Sulphate*
Vitriol, Oil of	*Sulphuric Acid*
Vitriol, White	*Zinc Sulphate*
Vleminck's Solution	*Liq. Calcis Sulphurat.*
Vomiting Salt	*Zinc Sulphate*
Wade's Drops	*Tinct. Benzoin. Co.*
Walker's Earth	*Fuller's Earth*
Ward's Essence	*Lin. Camph. Ammon.*
Ward's Paste	*Conf. Piper. Nig.*
White Copperas	*Zinc Sulphate*
White, Flake	*Lead Carbonate*
White Lead	*Lead Oxycarbonate*
White, Pearl	*Bismuth Oxychloride*
White Precipitate	*Ammoniated Mercury*
White, Spanish	*Bismuth Oxynitrate*
White Vitriol	*Zinc Sulphate*
White Zinc	*Zinc Carbonate*
Whitelaw's Tincture	*Tr. Lobeliæ Æther*
Wilkinson's Ointment	*Ung. Sulph. Co.*
Wilson's Ointment	*Ung. Zinci*
Yellow Basilicon Ointment	*Ung. Resinæ*
Zinc Flowers	*Zinc Oxide*

TABLE OF INCOMPATIBLES

The table below summarises the principal incompatible combinations likely to occur in prescriptions which may form dangerous or unpleasant mixtures.

Alkaloidal Salts	*With alkalies, alkaline carbonates, Donovan's solution, tannic acid, astringent tinctures, iodides, or bromides.*

Antipyrine . .	*With spirit of nitrous ether, nitrites, persalts of iron, sodium salicylate, chloral hydrate, or tannic acid.*
Arsenic . .	*With persalts of iron, magnesia, or astringents.*
Bromides . .	See *Iodides.*
Chloral Hydrate .	*With hot water or alkalies.*
Donovan's Solution	*With alkaloidal salts.*
Iodides . .	*With spirit of nitrous ether (unless alkalies are present), potassium chlorate, alkaloidal salts.*
Nitro-Glycerin Solution.	*With aqueous menstrua, unless sufficient alcohol is added to keep it in solution.*
Spirit of Nitrous Ether.	*With iodides and bromides. Also with antipyrine and sodium salicylate.*
Strychnine . .	See *Alkaloidal Salts.*

The following combinations may under certain conditions explode with violence :

Chlorates . .	*With phenol ; gallic, oxalic, salicylic, or tannic acids ; creosote ; glycerin ; hypophosphites ; iodine ; shellac ; catechu ; lycopodium ; sugar ; sulphur ; the sulphides of antimony.*
Iodine. .	*With strong ammonia. Iodine also combines violently with oil of turpentine.*
Silver Oxide .	*With creosote.*
Potassium Bichromate or Chromic Acid.	*With glycerin.*
Picrid Acid, and the Picrates.	*Do not triturate. Do not heat.*
Erythrol Tetranitrate.	*Also requires handling with caution.*

STATUTORY RESTRICTIONS ON THE SALE OF POISONS

By the Pharmacy Act of 1868 it is unlawful for any person, not being a pharmaceutical chemist or chemist and druggist within the meaning of the Act, to sell or keep open shop for the retailing, dispensing, or compounding of poisons described in the schedule. As the law has placed pharmacists in such a responsible position, it behoves them to see not only that all the provisions of the Act are duly observed, but that in all dealings of which poisons form a part the greatest care is exercised.

Precautions required by the Pharmacy Act, 1868, to be observed in Selling by Retail and in Dispensing Poisons.

All the articles named or referred to in the list, both in Part I. and Part II., are *poisons* within the meaning of the Pharmacy Act, 1868.

Sale by Retail

I. *Relating to Part I. and Part II. of the List.*—It is unlawful to sell any ' poison ' by retail unless the vessel, wrapper, or cover in which it is contained be distinctly labelled with *the name of the article*, and, in the case of mixtures, the percentage of poison present, the word *Poison*, and *the name and address of the seller.* This applies to all the articles in both parts of the list.

II. *Relating to Part I. only.*—It is unlawful to sell by retail any poison included in Part I. of the list to any person unknown to the seller, unless introduced by some person known to both parties ; and on every sale of any such article the seller shall before delivery make or cause to be made an entry in a book to be kept for that purpose, of—

(1) The date of sale ;
(2) The name and address of the purchaser ;
(3) The name and quantity of the article sold ; and
(4) The purpose for which it is stated to be required ;

to which the signature of the purchaser, and of the person, if any, who introduced him, shall be affixed. *The article must also be labelled with the name of the article, the word ' Poison,' and the name and address of the seller.*

III. *Relating only to Arsenic and its Preparations.*—It is unlawful to sell arsenic or any of its preparations unless in addition to all the foregoing regulations, the following provisions of the Arsenic Act are also observed :

(1) That the poison, if colourless, be mixed with at least one-sixteenth its weight of soot or half as much indigo, unless sold in a quantity of not less than ten pounds and for a purpose (*not* for use in agriculture) for which such admixture would render it unfit.

(2) That the person to whom the poison is sold or delivered be of mature age ;

(3) That the occupation as well as the name and address of the purchaser be entered in the poison book.

Dispensing

None of the foregoing regulations applies to any article when forming part of the ingredients of any medicine dispensed by a registered chemist and druggist ; but it is necessary, if a medicine contains a poison in-

cluded in Part I. or Part II. of the list, that the ingredients of the medicine, together with the name of the person to whom it is sold or delivered, is entered in a book kept for that purpose (*Prescription Book*), and the name and address of the seller be attached to the medicine.

Re-copying of Prescriptions containing Scheduled Poisons.—It is not considered absolutely necessary to re-copy such prescriptions each time they are dispensed, *but it is necessary* to enter the number of the prescription, name, date, and address of the patient each time, in order to comply with the foregoing, and for this purpose a special register should be kept.

List of Poisons within the meaning of the Act

PART I

Not to be sold unless *the purchaser is known to the seller, or is introduced by some person known to both parties :*

also entry to be made in Poison Book of—

(1) *Date of sale :*

(2) *Name and address of purchaser* ;

(3) *Name and quantity of article* ;

(4) *Purpose for which it is wanted* ; *attested by signature* ;

and must be labelled with—

(1) *Name of poison and, in the case of mixtures, the percentage of poison present.*

(2) *The word—* '*POISON*' ;

(3) *Name and address of seller*

Arsenic, and its medicinal preparations (see Note above).

Aconite, Aconitine, and their preparations.

Alkaloids—all poisonous vegetable alkaloids not specifically named in this Schedule, and their salts, and all poisonous derivatives of vegetable alkaloids.

Atropine, and its salts, and their preparations.

Belladonna, and all preparations or admixtures (except belladonna plasters) containing 0·1 or more per cent. of belladonna alkaloids.

Cantharides, and its poisonous derivatives.

***Coca,** any preparation or admixture of, containing 0·1 or more per cent. of coca alkaloids.

Corrosive Sublimate.

Cyanide of Potassium, and all poisonous cyanides and their preparations.

* These poisons are subject to special restrictions under the Dangerous Drugs Acts (see p. 394).

Not to be sold unless *the purchaser is known to the seller, or is introduced by some person known to both parties* ;

also entry to be made in Poison Book of—

(1) *Date of sale* ;

(2) *Name and address of purchaser* ;

(3) *Name and quantity of article* ;

(4) *Purpose for which it is wanted* ; *attested by signature* ;

and must be labelled with—

(1) *Name of poison and, in the case of mixtures, the percentage of poison present.*

(2) *The word—*
'*POISON*' ;

(3) *Name and address of seller.*

***Diamorphine,** and all preparations or admixtures containing 0·1 or more per cent. of diamorphine.

Diethyl-Barbituric Acid, and other alkyl, aryl, or metallic derivatives of barbituric acid, whether described as Veronal, Proponal, Medinal, or by any other trade name, mark, or designation ; and all poisonous Urethanes and Ureides.

***Ecgonine,** and all preparations and admixtures containing 0·1 or more per cent. of Ecgonine.

Emetic Tartar, and all preparations or admixtures containing 1 or more per cent. of emetic tartar.

Ergot of Rye, and preparations of ergot.

Lead in combination with Oleic Acid, or other higher fatty acids, whether sold as diachylon or under any other designation (except machine-spread plasters).

Nux Vomica, and all preparations or admixtures containing 0·2 or more per cent. of strychnine.

***Opium,** and all preparations or admixtures containing 0·2 or more per cent. of morphine.

Picrotoxin.

Prussic Acid, and all preparations or admixtures containing 0·1 or more per cent. of prussic acid.

Savin, and its oil, and all preparations or admixtures containing savin or its oil.

* These poisons are subject to special restrictions under the Dangerous Drugs Acts (see p. 394).

PART II

Must be labelled with—

(1) *Name of poison and, in the case of mixtures, the percentage of poison present.*

(2) *The word—*

' POISON ' ;

(3) *Name and address of seller.*

Almond, Essential Oil of (unless deprived of prussic acid).

Antimonial Wine.

Cantharides, tincture and all vesicating liquid preparations or admixtures of.

Carbolic Acid, and liquid preparations of carbolic acid and its homologues, containing more than 3 per cent. of those substances, except preparations for use as sheep wash or for any other purpose in connection with agriculture or horticulture, contained in a closed vessel distinctly labelled with the word ' Poisonous,' the name and address of the seller, and a notice of the special purposes for which the preparations are intended.

Chloral Hydrate.

Chloroform, and all preparations or admixtures containing more than 20 per cent. of chloroform.

Digitalis.

Mercuric Iodide.

Mercuric Sulphocyanide.

Oxalic Acid.

Poppies, all preparations of, excepting red poppy petals and syrup of red poppies (*Papaver rhœas*).

Precipitate, Red, and all oxides of mercury.

Precipitate White.

Strophanthus.

Sulphonal and its homologues, whether described as Trional, Tetronal, or by any other trade name, mark, or designation.

Zinc Chloride and liquid preparations of zinc chloride, *except* preparations intended to be used for soldering or other purely industrial purpose, provided that they are contained in closed vessels labelled with the word 'Poisonous' and bearing the name and address of the seller and a notice of the special purpose for which the preparations are intended.

All Preparations or Admixtures which are not included in Part I. of this Schedule, and contain a poison within the meaning of the Pharmacy Acts (see Note below), *except* preparations or admixtures the exclusion of which from this Schedule is indicated by the words therein relating to carbolic acid, chloroform, and coca, and except such substances as come within the provisions of Section 5 of the Poisons and Pharmacy Act, 1908.

Must be labelled with—
(1) *Name of poison and, in the case of mixtures, the percentage of poison present.*
(2) *The word—*
'POISON';
(3) *Name and address of seller.*

NOTE.—Special importance attaches to the last paragraph of Part II., as the effect of that paragraph is to include in Part II. many preparations and admixtures which are not specifically named in the Schedule, including preparations and admixtures of non-scheduled vegetable drugs—such as Calabar bean, colchicum, conium, gelsemium, hysocyamus, lobelia, stavesacre, stramonium, etc.—which contain poisonous principles.

The following articles may be sold by retailers other than pharmacists, but in all cases the sale is unlawful unless the conditions stated below are complied with:

Ammonia, liquid preparations of, containing more than 5 per cent. by weight of free ammonia.

Carbolic Acid (Carbolic substitutes, Carbolic Disinfectants), containing not more than 3 per cent. of Phenols.

Hydrochloric Acid.

Nitric Acid.

Oxalic Acid, soluble salts of.

Sulphuric Acid.

Only to be sold in bottles or other containers, rendered distinguishable by *touch* from ordinary bottles or containers.
Must be labelled with—
(1) *Name of article*;
(2) *The words—*
'POISONOUS — NOT TO BE TAKEN';
(3) *Name and address of seller.*

Agricultural and Horticultural Poisons

Poisonous substances to be used exclusively in agriculture or horticulture for the destruction of insects, fungi or bacteria, or as sheep-dips or weed-killers, which are poisonous by reason of their containing Arsenic Tobacco, or the Alkaloids of Tobacco.

These may only be sold by registered chemists and druggists, medical practitioners and persons licensed by local authorities.

When sold by *registered chemists and druggists* the provisions regulating the sale of poisons must be observed.

When sold by *licensed persons* the following provisions must be observed :

1. The poisonous substance must be sold in the original package as received from the manufacturer.

2. The package must be of sufficient strength to withstand rough usage, must be securely closed and free from leakage.

3. The package must be clearly labelled with (*a*) name of substance ; (*b*) the word ' *POISON* ' ; (*c*) the name and address of the seller ; and (*d*) a notice of the special purpose for which the substance has been prepared.

Dangerous Drugs Acts, 1920 and 1923.

Summary of Regulations made May 20th, 1921, and subsequently amended under Sections 3 and 7, which apply to Great Britain and Ireland.

Definitions.—**Morphine, Cocaine, Ecgonine** and **Diamorphine** (commonly known as heroin) and their respective salts, and medicinal **Opium** (' raw opium which has been artificially dried '), preparations and substances containing not less than one-fifth per cent. (one part in five hundred) of anhydrous morphine or one-tenth per cent. (one part in a thousand) of cocaine, ecgonine, or diamorphine (Sect. 7). **Raw Opium** includes powdered or granulated, but not medicinal, opium (Sect. 3).

Percentages are calculated (for Great Britain and Northern Ireland) on the basis of one gramme, or if a liquid one millilitre, in one hundred millilitres of the preparation.

Regulations (mainly under Section 7).

Possession.—Forbidden save to persons :

1. Licensed (or otherwise authorised), so long as conditions are carried out, to import, export, manufacture or supply the drugs, or

2. Otherwise licensed or authorised, *e.g.*, certified practising midwives (' preparation of opium ') ; hospital dispensers ; masters of ships and skippers of British fishing vessels (tr. chlorof. et morph. co. and tr. opii) ; masters of foreign ships (upon certificate of the port medical officer of health) ; farmers and stock-owners (who hold laudanum certificates from the police) ; occupiers of factories and workshops (cocaine eye-drops) ; or to

3. A person proving that the drug was supplied ' for his use ' by a medical practitioner or veterinary surgeon or on prescription ; or to

4. Authorised messengers (for other than dispensed medicines).

5. Medical practitioners ; dentists ; veterinary surgeons ; persons (firms or companies) lawfully keeping open shop for retailing poisons ; public analysts (' so far as is necessary for the practice of their profession or employment ') ; and (where approved) persons in charge of university, &c., laboratories may possess and supply the drugs, ' so far as is necessary for the practice of their profession or employment.'

Manufacture.—May be carried on (*a*) in a place specifically licensed (*e.g.*, for making morphine), or (*b*) in a shop kept by a chemist, &c., for retailing poisons, &c. :

1. By licensed or otherwise authorised persons, or in the case of preparations or dispensing by

2. Persons lawfully keeping open shop for retailing poisons.

Sale and Distribution.—Supply, procuring, offering to procure, or advertising the drugs for sale is permitted to—

1. Persons specially licensed or otherwise authorised. Also

2. When dispensed by a chemist on the prescription of (*a*) medical practitioners, (*b*) dentists, or (*c*) veterinary surgeons, or

3. By a medical practitioner or veterinary surgeon, or

4. When administered under the direct supervision of medical practitioners, or dentists ' in dental treatment,' or veterinary surgeons ' in the treatment of any animal.'

5. The container to be plainly marked (*a*) in the case of powders, solutions, or ointments, with the total quantity and percentage, or (*b*) in the case of tablets, &c., with the amount in each and number in the container, or (*c*) in the case of the alkaloids, and their salts and medicinal opium, the amount in the package.

6. Drugs may only be delivered to (*a*) persons licensed or otherwise authorised, or (*b*) persons producing from licensed or authorised persons written authorisation, which the person supplying the drug is satisfied is genuine.

These do not apply to dispensed medicines.

7. Sales to medical practitioners, dentists, veterinary surgeons, or other authorised persons must be carried out according to the regulations laid down in Sect. 17 of the Pharmacy Act, 1868, or Sect. 2 of the Sale of Poisons (Ireland) Act, 1870 (signing poison-book, &c.), or

8. By the alternative method (in Great Britain, and to medical practitioners, dentists, or veterinary surgeons only) of a signed order, bearing (*a*) name and address of purchaser, (*b*) name and quantity of the article to be purchased. Seller must (*a*) be 'reasonably satisfied' that the signature is that of the person purporting to sign it, (*b*) that he is a registered medical practitioner, &c., (*c*) make an entry in the poison-book (as well as the register kept under the Dangerous Drugs Act Regulations), with the words 'signed order' in the column assigned to the signature of purchaser, and (*d*) keep the order for two years.

9. In an emergency, orders may be supplied (under above method) without signature, &c., but purchaser must furnish an order within twenty-four hours.

Records.—1. Must be kept (*a*) for purchases, (*b*) for sales of drugs or preparations containing the quantities specified in the Act, but not for weaker preparations or for exempted preparations.

2. There is no officially specified book, but the *Purchases Register* must show (*a*) date on which supply was received, (*b*) from whom obtained, (*c*) address of supplier, (*d*) amount of drug obtained and (*e*) form in which obtained. *Sales Register* must show (*a*) date of transaction, (*b*) to whom supplied, (*c*) address and (*d*) authority of person, &c., to whom the drug is supplied, (*e*) amount of drug supplied, (*f*) form in which supplied, (*g*) and the ingredients, if sale is on prescription (but see 5, below).

3. Particulars of supplies or sales to be entered in separate registers or parts (in form specified above) for

(*a*) Cocaine and ecgonine
(*b*) Morphine
(*c*) Diamorphine
(*d*) Medicinal opium
} and substances containing them.
(*e*) Raw opium (under Section 3).

4. Separate registers must be kept for separate premises, but (if approved) separate registers may be kept for separate departments.

5. In lieu of the ' registers ' specified above, persons, &c., lawfully keeping open shop for the sale of poisons may make references, under the appropriate dates in a *book* ' to be kept for the purpose,' to entries in (*a*) the ' Poisons Book ' or (*b*) the ' Prescription Book,' but ' registers ' will still be needed for *purchases.*

6. In case of dispensed medicines (*other than Insurance prescriptions*), the entry required by the Pharmacy Act, 1868, must be made in the prescription book and in all cases a reference made in the appropriate D.D.A. register.

7. Registers and other records (mentioned in preceding paragraph) to be kept on the premises and available for inspection ' at all times,' and preserved for not less than two years from the date of the prescription or last entry.

8. Entries in the registers, &c., to be made (*a*) where the business is carried on ; (*b*) on the day when the drugs are received or transaction effected, or, ' if not reasonably convenient,' on the next day. (*c*) Entries not to be cancelled, obliterated, or altered, but errors to be corrected by marginal note or footnote.

9. Particulars must be furnished to persons authorised by the Secretary of State of (*a*) purchases, (*b*) stocks, or (*c*) transactions.

10. Licensees are usually required to convert their returns into terms of anhydrous morphine, diamorphine, cocaine, and ecgonine.

Prescriptions.—1. Must be (*a*) in writing, (*b*) dated, and (*c*) signed by the medical practitioner, dentist, or veterinary surgeon, with his ' usual signature ' and address. (*Insurance prescriptions need not give the address.*)

2. Must also give (*a*) the name and address of the person for whose use the prescription is given, (*b*) the total amount of the drug to be supplied, and (*c*) if

required to be supplied more than once, and not more than three times must be so directed, and the intervals specified in the prescription.

3. If an official form is issued that form must be used (*except in the case of Insurance prescriptions*). In an emergency, when the official form is not available, the prescription must be marked ' Official Form not available,' or with similar words.

4. When given by a dentist the prescription must be marked ' For local dental treatment only.'

5. When given by a veterinary surgeon the prescription must be marked ' For animal treatment only.'

Dispensing by Chemists.—1. Prescription must be on an official form (*if issued*).

2. When the prescription is not on official form the person dispensing must (*a*) be acquainted with the signature, (*b*) have no reason to suppose that the prescription is not genuine, or (*c*) have taken ' reasonably sufficient steps ' to satisfy himself that the prescription is genuine. In the case of *Insurance Prescriptions*, an alternative to (*a*) is that the chemist is acquainted with the person for whose use the prescription is given.

3. The drugs to be supplied on prescription once only, or, if directed, not more than three times ' at intervals to be specified ' in the prescription.

4. Entry must be made in the prescription-book (kept in accordance with the Pharmacy Act, 1868) and a reference made to the prescription in the appropriate D.D.A. register (see ' Records '). *Insurance prescriptions* need not be entered in the prescription book, but an entry must be made in the appropriate D.D.A. register.

5. Prescription to be marked with date on which it is dispensed.

6. Be retained for two years on the premises by the dispenser (*unless it is an Insurance prescription*), and

7. Be available for inspection.

The following lists indicate which of the more commonly known preparations come within the meaning of the Act.

Cocaine Section

The following preparations come within the meaning of the Act:

Preparation.	Authority.	Percentage of Cocaine.
Buginaria Cocainæ ($\frac{1}{6}$ grain C.HCl) .	B.P.C.	(1·0)
Cereoli Cocainæ ($\frac{1}{2}$ grain alkaloid) .	B.P.C.	(3·2)

Preparation.	Authority.	Percentage of Cocaine.
Chloral Camph. c. Cocaina	B.P.C.	10·0
Cocaine Eye Drops (Solut. No. 1. Factory Act)		0·5
Extractum Cocæ	B.P.C.	2·0
Extractum Cocæ Liquid	B.P. 1898	0·4 (about)
Extractum Cocæ Liquid Miscible	B.P.C.	0·4 (about)
Fol. Cocæ		0·5 (about)
Guttæ Atropine et Cocainæ	B.P.C.	1·8
Guttæ Cocainæ	B.P.C.	1·8
Guttæ Homatropinæ et Cocainæ	B.P.C.	0·9
Guttæ Hyoscinæ et Cocainæ	B.P.C.	0·9
Guttæ Physostigminæ et Cocainæ	B.P.C.	0·9
Guttæ Zinci Chlorid. et Cocainæ	B.P.C.	0·23
Inject. Cocainæ Hypodermica	B.P. 1898	9·0
Inject. Cocainæ Hypodermica	B.P. 1914	4·5
Inject. Hydrarg. Succinimid. Hypoderm.	B.P.C.	1·5
Insufflatio Menthol. et Cocainæ	B.P.C.	0·14
Lamellæ Cocainæ ($\frac{1}{50}$ grain C.HCl)	B.P.	(36·0)
Nebula Adreninæ c. Cocaina	B.P.C.	1·8
Nebula Benz. Comp. c. Cocaina et Quinin.	B.P.C.	0·68
Nebula Cocainæ Co.	B.P.C.	0·5
Nebula Eucalypt. et Menthol et Cocainæ	B.P.C.	0·5
Nebula Hyoscinæ Co.	B.P.C.	0·82
Nebula Menthol. Co.	B.P.C.	0·45
Nebula Menthol. et Cocainæ	B.P.C.	2·0
Oculentum Atropinæ c. Cocaina	B.P.C.	2·0
Oculentum Cocainæ	B.P.C.	2·0
Oleinatum Cocainæ	B.P.C.	5·0
Pastillus Cocaine ($\frac{1}{20}$, $\frac{1}{12}$, $\frac{1}{10}$, $\frac{1}{8}$, or $\frac{1}{6}$ grain C.HCl.)	B.P.C.	(Depends on strength)
Pastillus Cocainæ et Morphinæ ($\frac{1}{15}$ grain C.HCl)	B.P.C.	(0·18)
Pastillus Eucalyptol et Cocainæ ($\frac{1}{20}$ grain C.HCl)	B.P.C.	(0·14)
Pastillus Menthol. et Cocainæ ($\frac{1}{20}$ grain C.HCl)	B.P.C.	(0·14)
Pessus Cocainæ ($\frac{1}{2}$ grain C.HCl)	B.P.C.	(0·37)
Solvellæ Boracis et Cocainæ Co. ($\frac{1}{10}$ grain C.HCl.)	B.P.C.	(1·0)
Solvellæ Cocainæ (1 grain C.HCl)	B.P.C.	(90·0)
Solvellæ Cocainæ Fortis (5 grains CHCl)	B.P.C.	(90·0)

Preparation.	Authority.	Percentage of Cocaine.
Suppos. Adrenalini et Cocainæ ($\frac{1}{4}$ grain C.HCl)	B.P.C.	(1·44)
Suppos. Cocainæ ($\frac{1}{4}$ grain C.HCl)	B.P.C.	(1·44)
Tabellæ Cocainæ ($\frac{1}{20}$, $\frac{1}{12}$, $\frac{1}{10}$, $\frac{1}{8}$, or $\frac{1}{6}$ grain C.HCl)	B.P.C.	(Depends on strength)
Tablettæ Potas. Chlorat. et Boracis c. Cocaina ($\frac{1}{20}$ grain C.HCl)	B.P.C.	(0·9)
Tinct. Cocæ	B.P.C.	0·1
Troch. Krameriæ et Cocainæ ($\frac{1}{20}$ grain C.HCl)	B.P. 1914	(0·23)
Ung. Adrenalini et Cocainæ	B.P.C.	0·9
Ung. Cocainæ	B.P. 1914	4·0
Ung. Menthol. et Cocainæ	B.P.C.	10·0

Diamorphine Section

The following preparations come within the meaning of the Act :—

Preparation.	Authority.	Percentage. Diamorphine.
Pastillus Diamorphinæ ($\frac{1}{20}$ grain D.HCl)	B.P.C.	(0·14)
Troch. Diamorphinæ ($\frac{1}{20}$ grain D.HCl)	B.P.C.	(0·23)

Morphine Section

The following preparations come within the meaning of the Act :

Preparation.	Authority.	Percentage Anhydrous Morphine.
Acetum Opii	B.P.C.	1·0
Cereoli Ac. Tannic. et Opii (1 grain Opium)	B.P.C.	(0·66)
Chlorodynum	B.P.C.	0·4
Confect Opii	B.P. 1885	0·25
Ext. Opii	B.P. 1898	20·0
Ext. Opii Siccum	B.P. 1914	20·0
Ext. Opii Liq.	B.P. 1898	0·75
Ext. Opii Liq.	B.P. 1914	0·75
Inject. Morph. Acet.	B.P. 1885	8·25
Inject. Morphinæ et Atropinæ Hypod.	B.P.C.	5·1
Inject. Morph. Hypoderm.	B.P. 1885	8·25
Inject. Morph. Hypoderm.	B.P. 1898	4·2
Inject. Morph. Tart.	B.P. 1914	2·1
Insufflatio Bismuth. et Morph. Hydroch. (Ferrier's)	B.P.C.	3·25
Liquor Morph. Acet.	B.P.	0·75
Liquor Morph. Acet.	"Majendie"	2·6
Liquor Morph. Bimec.	B.P. 1885	0·75

Preparation.	Authority.	Percentage Anhydrous Morphine.
Liquor Morph. Hydrochlor.	B.P. 1914	0·8
Liquor Morph. Tart.	B.P. 1914	0·84
Liquor Morph. Vinosus	'Bell'	1·0
Liquor Opii Sedativ.	B.P.C.	1·0
Liquor Opii Sedativ.	'Bell'	1·0
Liquor Opii Sedativ.	'Battley'	2·0
Liquor pro Tinct. Camph. Co. (1-7)	—	0·4
Nepenthe		See original bottles.
Oleinatum Morphinæ	B.P.C.	2·0
Pil. Atropinæ et Morphinæ ($\frac{1}{6}$ grain M.HCl)	B.P.C.	(Depends on weight of pill.)
Pil. Saponis Co.	B.P. 1914	2·0
Pulv. Opii Co.	B.P. 1914	1·0
Suppos. Morphinæ ($\frac{1}{4}$ grain M.HCl)	B.P. 1914	(1·33)
Suppos. Opii		(Depends on strength)
Tab. Opii (1 grain Opium)	B.P.C.	(6·66)
Tab. Saponis Co. (1 grain Opium)	B.P.C.	(2·0)
Tinct. Chlorof. et Morph. Co.	B.P. 1898	0·8
Tinct. Chlorof. et Morph. Co.	B.P. 1914	0·8
Tinct. Opii	B.P. 1898	0·75
Tinct. Opii	B.P. 1914	1·0
Tinct. Opii Aquos.	(B.P. 1898)	0·75
Tinct. Opii Aquos.	(B.P. 1914)	1·0
Tinct. Opii Crocata	B.P.C.	0·5
Tinct. Opii Deodorat.	U.S.P.	1·0
Ung. Opii	'Bell'	1·0
Vin. Opii	B.P. 1885	1·0

Exemptions

Preparation.	Authority.
Cereoli Iodoformi et Morphinæ	B.P.C.
Diarrhœa Mixture	Board of Health
Elixir Diamorphin. et Pini Co.	B.P.C.
Elixir Diamorphin. et Terpini	B.P.C.
Elixir Cocæ	B.P.C.
Elixir Pini Co.	B.P.C.
Emplast. Opii	B.P. 1898
Glycer. Diamorphin.	B.P.C.
Linctus Diamorphine.	B.P.C.
Linctus Morphinæ Acidus	B.P.C.
Linctus Opiatus	B.P.C.
Linctus Sedativus	B.P.C.
Lin. Opii	B.P.

Preparation.	Authority.
Lin. Opii Ammon	B.P.C.
Lotio Plumbi c. Opio	B.P.C.
Mist. Acid. Hydrocyan. Co.	B.P.C.
Mist. Acid. Sulphuric. c. Opio	B.P.C.
Mist. Bismuth. Co. c. Morph.	B.P.C.
Mist. Chlorof. Co.	B.P.C.
Mist. Cretæ Co.	B.P.C.
Mist. Salina Anodyna	B.P.C.
Mist. Scillæ c. Opio	B.P.C.
Pastillus Diamorphin. Co.	B.P.C.
Pastillus Diamorphin. et Terpini Co.	B.P.C.
Pastillus Diamorphin. et Terp. et Menthol.	B.P.C.
Pastillus Morphinæ	B.P.C.
Pil. Digitalis et Opii Co.	B.P.C.
Pil. Hydrag. c. Creta et Opii	B.P.C.
Pil. Hydrag. c. Opio	B.P.C.
Pil. Ipecac. c. Scilla	B.P.
Pil. Plumbi c. Opio	B.P.
Pulv. Cretæ Arom. c. Opio	B.P.
Pulv. Ipecac. Co.	B.P.
Pulv. Kino Co.	B.P.
Spirit. Santal. Co. c. Morph.	B.P.C.
Suppos. Plumbi Co.	B.P.
Syrup. Camph. Co.	B.P.C.
Syrup Papaveris	B.P.C.
Tab. Ipecac. c. Scilla	B.P.C.
Tab. Plumbi c. Opio	B.P.C.
Tinct. Camph. Co.	B.P.
Tinct. Chlorof. et Morph.	B.P. 1885
Tinct. Opii Ammon.	B.P.
Troch. Chlorodyni	B.P.C.
Troch. Lini Glycyrrh. et Chlorodyni	B.P.C.
Troch. Morphinæ	B.P.
Troch. Morph. et Ipecac.	B.P.
Troch. Opii	B.P.C.
Ung. Gallæ Co.	B.P.C.
Ung. Gallæ c. Opio	B.P.
Vinum Cocæ	B.P.C.
Vinum Cocæ et Quinin. Phosph.	B.P.C.

Special Precautions

With a view to the prevention of accidents, the Pharmaceutical Society strongly recommends all pharmacists to adopt special precautions when dealing with the following articles : Acetanilide, Amyl Nitrite, Antipyrine (Phenazone), Butyl-Chloral Hydrate, Cannabis Indica and its preparations, Elaterium, Phenacetin, and Vermin Killers containing free Phosphorus. The sale of such articles as Adrenalin, Lead Salts, Phosphorus and

preparations containing Phosphorus in the free state, Poisonous Glucosides and Preparations containing Potassium Bichromate, Synthetic Cocaine-Substitutes, Zinc Salts, &c., also demand special precautions.

Regulations for the Keeping, Dispensing, and Selling of Poisons

The following, having been prescribed by the Pharmaceutical Society of Great Britain with the consent of the Privy Council, form part of the Pharmacy Act, 1868, by virtue of the Provisions of Section 1 of that Act :

1. That in the keeping of poisons each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

2. That in the keeping of poisons each poison be kept according to one of the following systems, viz. :

(*a*) In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary ; or

(*b*) In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary ; or

(*c*) In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.

3. That in the dispensing and selling of poisons all liniments, embrocations, lotions, and liquid disinfectants containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine-bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

Experience has taught that the greatest safety is secured by keeping all poisons and potent remedies in a cupboard by themselves. As an extra safeguard this cupboard may be kept locked, and a bell so arranged that an alarm is given each time of opening. Where two or more dispensers are kept, no poisons should ever be dispensed or sold without the presence of a qualified witness, whose duty it should be to make a note in a book kept for the purpose of the name and amount of medicament and the number of the prescription. Both his own and the dispenser's initials should be affixed. It is impossible to bestow too much care on the keeping and dispensing of poisons, and in every case of doubt the dispenser should,

no matter at what cost of time and trouble, assure himself that he is carrying out the *intention* of the prescriber.

A copy of the Poison Schedule should be hung in the immediate vicinity of the poison cupboard ; also a table of antidotes for the more commonly occurring poisons, so as to be handy in case of emergency.

In retailing poisonous substances it is always better to err on the side of caution. Although all the poisons in the schedule *may* be sold if the legal requirements are fulfilled, yet it is the duty of a pharmacist to supply them *only when he can reasonably assure himself that they are to be used for legitimate purposes.*

POISONS AND THEIR ANTIDOTES

In case of poisoning, first send for a medical man ; then administer an emetic, unless corrosive acids or strong alkalies are known to have been swallowed. The safest emetics are :

1. One tablespoonful of common salt in a tumbler of warm water.

2. One tablespoonful of mustard in a tumbler of warm water.

3. One to two tablespoonfuls of ipecacuanha wine.

4. Thirty grains of zinc sulphate in half a tumbler of warm water.

5. One-tenth grain of apomorphine hydrochloride injected hypodermically.

Stomach Syphon.—This consists of soft rubber tubing, about half an inch in diameter and six feet in length. One end is oiled and passed down the gullet into the stomach ; the other end being raised above the patient's head, the tube is *filled* with water by means of a funnel, pinched tightly to prevent the water escaping, and lowered, when, on relaxing the pressure, syphoning commences. If necessary, after evacuation of the stomach, water should be administered, and the operation repeated.

A stomach syphon must not be used in cases of poisoning with corrosive acids or alkalies, on account of the danger to the injured membrane.

Acid, Carbolic ; Carbolic Disinfectants.	Wash out stomach with soft rubber syphon. Give large doses of olive or any bland oil. The whites of several eggs beaten up in a little water. Afterwards brandy and spirit of sal volatile.

Acid, Oxalic ; Oxalates.	Stomach syphon dangerous unless used very carefully and without appreciable loss of time. Give calcium chloride or chalk, whiting or magnesia, as for mineral acids. Soda or potash useless owing to formation of soluble salt.
Acid, Prussic, and Cyanides.	Ferric hydroxide antidote* ; brandy. Artificial respiration. Oxygen.
Acids, Corrosive.	Chalk, whiting or magnesia in water—or wall plaster or whiting from ceiling. Afterwards milk, olive or any bland oil ; boiled oatmeal or linseed gruel. *Do not use Stomach Pump or Syphon.*
Aconite.	Emetic ; animal charcoal in water ; stimulants — brandy, ether, ammonia. Hot-water bottles to feet and chest.
Alkalies : Ammonia, Potash, Soda.	Vinegar ; citric or tartaric acid ; lemon juice. Milk, olive oil, white of egg, linseed tea or oatmeal gruel. Brandy. *Do not use Stomach Pump or Syphon.*
Antimony Salts.	Emesis generally produced. Give copious draughts of warm water, tannic acid, strong tea (*boil* the leaves to extract the tannin) ; white of egg. Brandy, spirit of sal volatile.
Arsenic Compounds : Weed Killers, Sheep Dips.	If strongly caustic weed killer has been taken, treat first for the alkali (*q.v.*). If simple arsenical poisoning, use stomach syphon, or give emetic ; ferric hydroxide antidote* ; dialysed iron, milk, white of egg, magnesia. Oatmeal gruel, linseed tea.

* *Ferric Hydroxide Antidote :*

A	Solution of ferric sulphate B.P. .	75 minims.
	Distilled water	½ ounce.
B	Light magnesia	17½ grains.
	or	
	Milk of magnesia . . .	6 fluid drachms.
	Distilled water	3 ounces.

For one dose : mix A and B when required.

Atropine.	*See* BELLADONNA.
Barium Salts.	Epsom or Glauber's salt in water ; emetic.
Belladonna.	Stomach syphon or emetic ; 20 gr. tannic acid, strong tea made by *boiling* the leaves ; charcoal and water ; hypodermic injection of ¼ gr. pilocarpine nitrate. Artificial respiration. Oxygen.
Cantharides.	Emetic *at once.* Empty stomach by means of soft tube. Proceed very carefully if there is blistering. Opium ; morphine subcutaneously. Linseed tea, oatmeal gruel.
Chloroform ; Chloral.	Stomach tube, emetic, fresh air, artificial respiration, oxygen. Amyl nitrite inhalation ; 10 min. of solution of strychnine hydrochloride B.P.
Colchicum ; Conium.	Emetic, egg albumen, tannic acid, strong tea.
Copper Salts ; Verdigris, Blue Vitriol.	If vomiting has not occurred, use stomach syphon. Give 10 gr. potassium ferrocyanide in a little water. Give chalk or magnesia, milk, and white of egg. Poultice abdomen.
Digitalis.	Stomach syphon or emetic ; 20 gr. tannic acid or very strong tea made by *boiling* the leaves ; animal charcoal in water.
Eserine.	Stomach tube or emetic ; tannic acid.
Fungi.	Stomach tube or emetic ; treat on general principles.
Gases : Coal Gas, Sewer Gas, Nitrous Fumes, &c.	Artificial respiration ; oxygen ; treat on general principles.
Henbane.	As for Belladonna.
Iodine.	30 gr. sodium sulphite or common 'hypo' in water ; two or three teaspoonfuls solution of saccharated lime in water ; mucilage of starch, tragacanth, or arrowroot ; linseed tea, &c.

Lead Salts.	Epsom or Glauber's salt in water. Stomach tube ; emetic.
Mercury Salts : Corrosive Sublimate, White or Red Precipitate.	Emetic ; stomach tube ; copious draughts of milk ; white of egg beaten up in milk.
Opium : Morphine, Chlorodyne, &c.	Stomach tube, emetic ; potassium permanganate (10 gr. in a pint of water). Brandy, ether, ammonia, strong coffee. Keep patient moving, and stimulate body. Artificial respiration.
Phosphorus : Rat Paste.	Stomach tube ; emetic ; 2 gr. copper sulphate in a little water. Half a teaspoonful of Sanitas in water at intervals of twenty minutes *for first hour.* Copious draughts of milk. *Avoid oil.*
Silver Salts.	A tablespoonful of common salt in warm water both as an antidote and as an emetic ; white of egg. Milk.
Strychnine : Vermin Killer.	Prompt emetic or use of stomach syphon ; 20 gr. tannic acid in water ; very strong tea made by *boiling* the leaves ; a draught containing potassium bromide 1 dr., chloral hydrate 20 gr. Chloroform inhalation between spasms ; amyl nitrite inhalation between spasms or subcutaneously.
Zinc Salts.	Sodium or potassium bicarbonate in water ; soap solution ; tannic acid ; copious draughts of milk.

INDICATORS

Brazil-wood Solution.—Boil 50 grammes of finely-cut Brazil-wood (the heartwood of *Peltophorum dubium*) with 100 c.c. of water during half an hour, replacing the water from time to time. Allow the mixture to cool, strain, wash the contents of the strainer with water until 100 c.c. of strained liquid is obtained, add 25 c.c. of alcohol, and filter. Care should be taken to exclude ammoniacal vapours while filtering. This solution is turned purplish-red by alkalies, and yellow by acids.

Cochineal Test Solution.—Macerate 1 gramme of unbroken cochineal during four days with 20 c.c. of alcohol and 60 c.c. of water. Filter. The colour of this test solution is turned violet by alkalies, and yellowish-red by acids. Cochineal T.S. is useful in titrating alkaloids, inorganic acids, ammonia, the alkalies, and alkaline earths. The presence of salts of iron, alumina, or copper should be avoided. This indicator is useless for titrating organic acids.

Hematoxylin Test Solution.—Dissolve 0·2 gramme of hematoxylin in 100 c.c. of alcohol. Use about five drops for each titration. This indicator assumes a yellow to orange colour in acid solutions, and a violet to purple colour in alkaline solutions. The titration is complete when the change in colour remains permanent upon the addition of one drop of the volumetric solution after stirring the liquid.

Iodeosin Test Solution.—Dissolve 0·1 gramme of iodeosin, $C_{20}H_8I_4O_5$ (tetraiodofluorescein), in 100 c.c. of alcohol. This indicator becomes colourless in acid solutions, changing to pink in alkaline solutions. Dilute the solution to be titrated in a 200 c.c. flask with distilled water to about 100 c.c., add 20 c.c. of ether and five drops of the iodeosin T.S., cork, and shake well. Then add the volumetric alkali solution gradually, shaking well after each addition. The titration is complete when the lower aqueous solution retains a faint pink colour after shaking thoroughly. For assaying alkaloidal residues, dissolve the latter in a measured excess of volumetric acid solution, and transfer the acid solution to a 200 c.c. flask, washing the container well with water until the contents of the flask measure about 100 c.c. Then proceed as above.

Litmus Paper and Test Solution.—Exhaust powdered litmus with three separate and successive portions (representing about four times its weight) of boiling alcohol (which removes the undesirable colour erythrolitmin), each extraction lasting for about one hour. After draining off the alcohol, digest the residue with about an equal weight of cold water and filter. (This blue solution, which contains some alkali, after being acidulated, may be used to make red litmus paper.) Finally, extract the residue with about five times its weight of boiling water, and, after thoroughly cooling, filter. The addition of one drop of decinormal acid or alkali V.S. to 50 c.c. of water containing five drops of the indicator should produce a distinct change in colour. Preserve the filtrate, as test solution, in wide-mouthed bottles stoppered with loose plugs of cotton so as to exclude dust but admit air. The

blue colour of litmus test solution is changed by acids to red, and this red colour by the addition of alkalies is restored to blue.

Litmus Paper, Blue.—Impregnate with the test solution just described strips of white unsized paper, free from wood pulp, but not too porous, and dry by suspending them on lines of clean twine, in an atmosphere free from acid or ammoniacal vapours.

Litmus Paper, Red.—Prepare this with the same kind of paper and in the same manner as described in the preceding paragraph. Add to the test solution used to impregnate the paper just sufficient of a highly diluted solution of hydrochloric acid to impart to it a faint red tint. Neither blue nor red litmus paper should have a very intense colour. Preserve the test paper in bottles, so as to exclude dust and acid or ammoniacal vapours.

Methyl-orange Test Solution.—Dissolve 1 gramme of methyl orange, $NaC_{14}H_{14}N_3SO_3$ (the sodium or ammonium salt of dimethylamidoazobenzene sulphonic acid ; also known as helianthin, tropæolin D, or Poirrier's Orange 3 P), in 1,000 c.c. of water. Add to it carefully, with constant stirring, decinormal sulphuric acid V.S., in drops, until the liquid turns red and just ceases to be transparent. Then filter.

Excessive quantities of this indicator should be avoided in titrating ; from one to three drops is sufficient for a volume of from 50 to 100 c.c., or just enough is added to impart a faint tint to the solution, which if neutral should change to red or yellow respectively upon the addition of two drops of decinormal acid or alkali V.S.

Methyl-orange is suitable for titrating inorganic acids, alkalies, alkali carbonates or bicarbonates ; also certain alkaloids, as morphine and quinine. It is not to be employed in titrating organic acids, nor in alcoholic or boiling solutions.

This indicator gives a yellow colour with alkalies and red with acids.

Phenolphthalein Test Solution.—Dissolve 1 gramme of phenolphthalein ($C_{20}H_{14}O_4$) in 50 c.c. of alcohol and dilute to 100 c.c. with water. About three drops is sufficient for 50 c.c. of the solution to be titrated ; it gives a red colour with alkali hydroxides or carbonates, while acids render the solution colourless. Phenolphthalein may be employed in hot titrations. It is not suitable as an indicator for ammonia, but is largely used for organic

acids, alkali hydroxides, and for carbonates and bicarbonates in boiling solutions.

Phenolphthalein Paper is prepared by impregnating white unsized paper with the test solution and drying.

Turmeric Tincture.—Digest any convenient quantity of ground turmeric root repeatedly with small quantities of water and discard the liquids. Then digest the dried residue for several days with six times its weight of alcohol and filter.

Turmeric Paper.—Impregnate white unsized paper with the tincture, and dry it. The tincture, as well as the paper, turns brown with alkalies, and the original yellow colour is restored by acids, with the exception of boric acid, which, even in the presence of hydrochloric acid, turns the colour to reddish brown, and this is changed to bluish black by ammonia.

OTHER TEST PAPERS

White unsized paper, free from wood pulp, should be used. The sheets, after dipping, should be suspended on lines of clean twine. in an atmosphere free from dust and acid or ammoniacal vapours. The decoctions or tinctures must not come in contact with metals.

1. **Brazil Paper.**—Boil Brazil-wood chips in water for an hour, until a strongly coloured decoction results. Cool and filter. It is turned yellow by acids, purplish red by alkalies.

2. **Dahlia Paper.**—Make a tincture in 30 per cent. alcohol of the petals of violet or dark crimson coloured dahlias. This is very sensitive. Turns green with alkalies, red with acids.

3. **Elderberry Paper.**—As Dahlia paper.

4. **Potassium Iodide and Starch Paper.**—Prepare a mucilage with arrowroot, boiling thoroughly ; when nearly cool add 5 per cent. potassium iodide. Dissolve.

5. **Lead Paper.**—The solution contains 5 per cent. lead acetate.

6. **Litmus Paper.**—*See* INDICATORS.

7. **Turmeric Paper.**—*See* INDICATORS.

8. **Manganese Paper.**—Solution of manganese sulphate. In an ozonised atmosphere it turns brown or black.

Table of Thermometric Equivalents according to the Centigrade and Fahrenheit Scales

To convert Degrees F. into Degrees C.: $\frac{(F° - 32)}{9} \times 5.$

To convert Degrees C. into Degrees F.: $\frac{C° \times 9}{5} + 32.$

Centigrade		Fahrenheit	Centigrade		Fahrenheit	Centigrade		Fahrenheit
0°	=	32·0°	34°	=	93·2°	68°	=	154·4°
1°	=	33·8°	35°	=	95·0°	69°	=	156·2°
2°	=	35·6°	36°	=	96·8°	70°	=	158·0°
3°	=	37·4°	37°	=	98·6°	71°	=	159·8°
4°	=	39·2°	38°	=	100·4°	72°	=	161·6°
5°	=	41·0°	39°	=	102·2°	73°	=	163·4°
6°	=	42·8°	40°	=	104·0°	74°	=	165·2°
7°	=	44·6°	41°	=	105·8°	75°	=	167·0°
8°	=	46·4°	42°	=	107·6°	76°	=	168·8°
9°	=	48·2°	43°	=	109·4°	77°	=	170·6°
10°	=	50·0°	44°	=	111·2°	78°	=	172·4°
11°	=	51·8°	45°	=	113·0°	79°	=	174·2°
12°	=	53·6°	46°	=	114·8°	80°	=	176·0°
13°	=	55·4°	47°	=	116·6°	81°	=	177·8°
14°	=	57·2°	48°	=	118·4°	82°	=	179·6°
15°	=	59·0°	49°	=	120·2°	83°	=	181·4°
16°	=	60·8°	50°	=	122·0°	84°	=	183·2°
17°	=	62·6°	51°	=	123·8°	85°	=	185·0°
18°	=	64·4°	52°	=	125·6°	86°	=	186·8°
19°	=	66·2°	53°	=	127·4°	87°	=	188·6°
20°	=	68·0°	54°	=	129·2°	88°	=	190·4°
21°	=	69·8°	55°	=	131·0°	89°	=	192·2°
22°	=	71·6°	56°	=	132·8°	90°	=	194·0°
23°	=	73·4°	57°	=	134·6°	91°	=	195·8°
24°	=	75·2°	58°	=	136·4°	92°	=	197·6°
25°	=	77·0°	59°	=	138·2°	93°	=	199·4°
26°	=	78·8°	60°	=	140·0°	94°	=	201·2°
27°	=	80·6°	61°	=	141·8°	95°	=	203·0°
28°	=	82·4°	62°	=	143·6°	96°	=	204·8°
29°	=	84·2°	63°	=	145·4°	97°	=	206·6°
30°	=	86·0°	64°	=	147·2°	98°	=	208·4°
31°	=	87·8°	65°	=	149·0°	99°	=	210·2°
32°	=	89·6°	66°	=	150·8°	100°	=	212·0°
33°	=	91·4°	67°	=	152·6°			

Table shewing the relation of Degrees of Baumé's Hydrometer to Specific Gravities

Degrees Baumé	Specific Gravity	Degrees Baumé	Specific Gravity	Degrees Baumé	Specific Gravity	Degrees Baumé	Specific Gravity
For Liquids Heavier than Water							
0	1·0000	19	1·1507	38	1·3551	57	1·6477
1	1·0069	20	1·1600	39	1·3679	58	1·6666
2	1·0139	21	1·1693	40	1·3809	59	1·6860
3	1·0211	22	1·1788	41	1·3942	60	1·7058
4	1·0283	23	1·1885	42	1·4077	61	1·7261
5	1·0357	24	1·1983	43	1·4215	62	1·7469
6	1·0431	25	1·2083	44	1·4356	63	1·7682
7	1·0507	26	1·2184	45	1·4500	64	1·7901
8	1·0583	27	1·2288	46	1·4646	65	1·8125
9	1·0661	28	1·2393	47	1·4795	66	1·8354
10	1·0740	29	1·2500	48	1·4949	67	1·8589
11	1·0820	30	1·2608	49	1·5104	68	1·8831
12	1·0902	31	1·2719	50	1·5263	69	1·9079
13	1·0984	32	1·2831	51	1·5425	70	1·9333
14	1·1068	33	1·2946	52	1·5591	71	1·9595
15	1·1153	34	1·3063	53	1·5760	72	1·9863
16	1·1240	35	1·3181	54	1·5934	73	2·0139
17	1·1328	36	1·3302	55	1·6111	74	2·0422
18	1·1417	37	1·3425	56	1·6292	75	2·0714
For Liquids Lighter than Water							
10	1·0000	27	0·8917	43	0·8092	59	0·7407
11	0·9929	28	0·8860	44	0·8045	60	0·7368
12	0·9859	29	0·8805	45	0·8000	61	0·7329
13	0·9790	30	0·8750	46	0·7954	62	0·7290
14	0·9722	31	0·8695	47	0·7909	63	0·7253
15	0·9655	32	0·8641	48	0·7865	64	0·7216
16	0·9589	33	0·8588	49	0·7821	65	0·7179
17	0·9523	34	0·8536	50	0·7777	66	0·7142
18	0·9459	35	0·8484	51	0·7734	67	0·7106
19	0·9395	36	0·8433	52	0·7692	68	0·7070
20	0·9333	37	0·8383	53	0·7650	69	0·7035
21	0·9271	38	0·8333	54	0·7608	70	0·7000
22	0·9210	39	0·8284	55	0·7567	71	0·6965
23	0·9150	40	0·8235	56	0·7526	72	0·6930
24	0·9090	41	0·8187	57	0·7486	73	0·6896
25	0·9032	42	0·8139	58	0·7446	74	0·6863
26	0·8974						

To convert Degrees Baumé to Specific gravity—

(*a*) For liquids lighter than water : $\frac{144}{\text{Baumé}^\circ + 134}$

(*b*) For liquids heavier than water : $\frac{144}{144 - \text{Baumé}^\circ}$

To convert Specific gravity to Degrees Baumé—

(*a*) For liquids lighter than water : $\frac{144}{\text{Sp. Gr.}} - 134.$

(*b*) For liquids heavier than water : $144 - \frac{144}{\text{Sp. Gr.}}$

To convert Degrees Twaddell to Specific gravity—

Twaddell ° × 0·005 + 1·000.

To convert Specific gravity to Degrees Twaddell—

Sp. Gr. — 1·000 ÷ 0·005.

SPECIFIC VOLUME OF CERTAIN COMMON LIQUIDS

Specific volume is the antithesis of specific gravity. To obtain the specific volume of any liquid, the measure of a given weight is divided by the measure of an equal weight of water.

Example.—Specific gravity of sulphuric acid is 1·843 ; this divided into 1·000 (the specific gravity of water) = 0·5425, the volume a given weight would occupy *compared with the same weight of water.*

Volume occupied by 1 *lb. Avoir. at* 15·5° C. (60° F.)

	Fluid ounces.
Acid, Hydrochloric (31·79 per cent.)	13·792
Acid, Nitric (70 per cent.)	11·267
Acid, Sulphuric (98 per cent.)	8·680
Ether (sp. gr. ·730)	21·920
Alcohol, Absolute	20·144
Alcohol (90 per cent.)	19·164
Benzol (sp. gr. ·884)	18·256
Glycerin	12·688
Olive Oil	17·456
Mercury	1·168
Chloroform	10·736
Simple Syrup	12·016
Carbon Disulphide	12·608

RELATIONS OF METRIC AND IMPERIAL MEASURES

Mass

1 milligram (0·001 gramme)	=	0·015 grain
1 centigram (0·01 ,,)	=	0·154 ,,
1 decigram (0·1 ,,)	=	1·543 grains
1 gramme (1·0 ,,)	=	15·432 ,,
1 kilogram (1000 ,,)	=	35·274 ounces or 2·2046 pounds
1 grain	=	0·0648 gramme
1 ounce (avoir.)	=	28·350 grammes
1 pound (avoir.)	=	453·59 ,,

Capacity

1 centimil	=	0·169 minim.
1 decimil	=	1·69 minims
1 millilitre, or mil	=	16·9 ,,
1 litre	=	35·196 fluid ounces, or 1·76 pints
1 minim	=	0·0592 mil.
1 fluid drachm	=	3·5515 mils.
1 fluid ounce	=	28·4123 ,,
1 pint	=	568·2454 ,,

Length

1 micron (μ)	=	0·00003937 inch
1 millimetre	=	0·039370 ,,
1 centimetre	=	0·39370 ,,
1 decimetre	=	3·9370 inches
1 metre	=	39·370113 ,,
1 inch	=	25·3999 millimetres

Table for Converting Grammes per Litre to Grains per Pint

1 gramme per litre	=	8·75 grains per pint
10 grammes per litre	=	87·5 ,, ,,
25 grammes per litre	=	½ ounce (av.) per pint
100 grammes per litre	=	2 ,, ,, ,,

Table for Converting Mils per Litre to Minims per Pint

1 mil per pitre	=	9·6 minims per pint
10 mils per litre	=	96 ,, ,,
25 mils per litre	=	¼ ounce (fluid) per pint
100 mils per litre	=	2 ,, ,, ,,

Table for Converting Grammes per Kilogram to Grains per Pound

1 gramme per 1,000 grammes	=	7 grains per pound
10 grammes per 1,000 grammes	=	70 ,, ,,
100 grammes per 1,000 grammes	=	700 ,, ,, or 1 ounce (av.) 262½ grains

Table for Converting Mils per Kilogram to Minims per Pound

1 mil per 1,000 grammes	=	7·68 minims per pound
10 mils per 1,000 grammes	=	76·8 ,, ,,
100 mils per 1,000 grammes	=	768 ,, ,, or 1 ounce (fluid) 288 minims

Table for Converting Grains per Pint to Grammes per Litre

1 grain per pint	=	0·1143 gramme per litre
10 grains per pint	=	1·1429 ,, ,,
100 grains per pint	=	11·4286 ,, ,,
½ ounce (av.) per pint	=	25 ,, ,,
2 ounces (av.) per pint	=	100 ,, ,,

Table for Converting Minims per Pint to Mils per Litre

1 minim per pint	=	0·1042 mil per litre
10 minims per pint	=	1·0416 ,, ,,
60 minims per pint	=	6·25 ,, ,,
½ ounce (fluid) per pint	=	25 ,, ,,
2 ounces (fluid) per pint	=	100 ,, ,,

Table for Converting Grains per Pound to Grammes per Kilogram

1 grain per pound	=	0·1429 grammes per 1,000 grammes
10 grains per pound	=	1·4286 ,, ,,
100 grains per pound	=	14·2857 ,, ,,
½ ounce (av.) per pound	=	31·25 ,, ,,
2 ounces (av.) per pound	=	125 ,, ,,

Table for Converting Minims per Pound to Mils per Kilogram

1 minim per pound	=	0·1302 mil per 1,000 grammes
10 minims per pound	=	1·3021 ,, ,,
60 minims per pound	=	7·8125 ,, ,,
½ ounce (fluid) per pound	=	31·25 ,, ,,
2 ounces (fluid) per pound	=	125 ,, ,,

ALCOHOL

Rectified and Methylated Spirit

Ethylic alcohol is a product of the fermentation of saccharine liquids. Its manufacture may be briefly divided into three operations:

(*a*) The preparation of a saccharine liquid by the action of diastase on starch.

(*b*) Fermentation of this liquid by yeast.

(*c*) Separation of the alcohol by distillation.

In this country the chief sources of alcohol are malt, maize, rice, sago, tapioca, barley, rye, oats, sugar, and molasses. Maize constitutes 75 per cent. of the grain used. In other countries potatoes and beet are largely employed. Grain, preferably barley, is moistened and stimulated to germinate by heat. During germination changes take place, a ferment, *diastase*, being formed, which, under suitable conditions, is capable of converting the insoluble starch in the endosperm into maltose and dextrin. At a certain point growth is arrested by drying the grain at a low temperature. As the dried product, *malt*, contains sufficient diastase to convert a considerable amount of added starch, it is mixed with unmalted grain and the ground mixture infused with water at about 60°, the resulting liquor being known as the *mash*. A second mashing generally exhausts the grain, and the liquors, having been cooled to about 15°, are mixed with yeast. Fermentation soon commences, the yeast cells multiplying with great rapidity, transforming the sugars into alcohol and carbon dioxide—

$$\underset{\text{Maltose}}{C_{12}H_{22}O_{11}} + H_2O = 4\underset{\text{Alcohol}}{C_2H_5OH} + 4CO_2$$

The weak alcoholic liquid (containing from 13 to 15 per cent. of alcohol) is next distilled in a fractionating still, the ' head ' or upper part of which is so arranged that most of the water is condensed and returned to the still, while the alcohol passes into the receiver. Although with a modern still the strength of the alcohol may reach 80 to 90 per cent., it is not sufficiently pure for medicinal purposes, as traces of other alcohols and impurities remain which impart to it a disagreeable odour and taste. These are removed by diluting with water, filtering through charcoal, and refractionating.

Rectified Spirit of the Pharmacopœia contains 90 per cent. by volume of ethyl hydroxide, C_2H_5OH (85·68 per cent. by weight), and has a specific gravity of 0·8337. For accurately determining the percentage of alcohol in spirit the density must be ascertained by means of a specific gravity bottle and referred to an alcohol table. For Excise and general purposes Sikes' hydrometer (*see* chapter on Specific Gravity) is employed. In England the legal temperature is fixed at 51° F., the spirit being valued, not according to percentage of alcohol by volume or weight, but according to the amount of ' proof spirit.' This term is defined by Act 58 Geo. III. as being ' such as shall at a temperature of 51° F. weigh exactly $\frac{12}{13}$ of an equal measure of distilled water.' Proof spirit has a specific gravity of 0·91976 at 15·5° and contains 57·10 per cent. by volume (49·28 per cent. by weight) of ethyl hydroxide. Weaker spirits are termed ' underproof '

(u.p.) and stronger spirits 'over-proof' (o.p.). Thus 25 degrees over-proof means that 100 volumes of the spirit diluted with water yield 125 volumes of proof spirit, whilst 25 degrees under-proof means that 100 volumes contain 75 volumes of proof spirit and 25 volumes of water.

To convert Percentage of Alcohol by Weight into Percentage by Volume.

Rule.—Multiply percentage by weight by specific gravity and divide by 0·79367.

Example.—49·5 per cent. by weight = 57·3 per cent. by volume (49·5 × 0·920 ÷ 0·79367 = 57·3).

To convert Percentage of Alcohol by volume into Percentage by Weight.

Rule.—Divide 0·79367 by specific gravity and multiply quotient by percentage by volume.

Example.—57·3 per cent. by volume = 49·5 per cent. by weight (0·79367 ÷ 0·920 × 57·3 = 49·5).

To convert Percentage by Volume into Percentage of Proof Spirit.

Rule.—Multiply by 1·7535.*

Example.—90 per cent. alcohol by volume
= 90 × 1·7535.
= 157·8 per cent. proof.

If the product exceeds 100, subtract 100, then the difference = degrees o.p.

Example.—60 per cent. alcohol by volume
= 60 × 1·7535
= 105·2 per cent. proof.
Then degrees o.p. = 105·2 — 100
= 5·2 o.p.

If the product is less than 100, subtract product from 100, then the difference = degrees u.p.

Example.—45 per cent. alcohol by volume
= 45 × 1·7535
= 78·9 per cent. proof
Then degrees u.p. = 100 — 78·9
= 21·1 u.p.

* Absolute alcohol is 75·35 degrees o.p. or 1·7535 times the strength of proof spirit.

To convert Percentage of Proof Spirit into Percentage by Volume.

Rule.—Multiply by 0·57028.*

Example.—157·8 per cent. proof = 157·8 × 0·57028
= 90 per cent. volume

To convert Degrees Over-proof into Percentage by Volume.

Rule.—Add 100 and multiply by 0·57028.

Example.—58° o.p. = 100 + 58 × 0·57028
= 90 per cent. by volume.

To convert Degrees Under-proof into Percentage by Volume.

Rule.—Subtract degrees u.p. from 100 and multiply difference by 0·57028.

Example.—30° u.p. = 100 — 30 × 0·57028
= 39·9 per cent. by volume.

Formula for Diluting a Liquid of any Specific gravity to any Lower Specific gravity

$$x = \frac{G \times a}{S \times g}$$

where

x = quantity of water to be added, in grammes.
G = weight of liquid to be diluted, in grammes.
a = difference (in grammes) between known and required specific gravities.
S = specific gravity of liquid to be diluted.
g = difference in weight (in grammes) of the required gravity and that of 1 litre of water.

Example.—*Given* 4,000 *grammes of a liquid of specific gravity* 1·275 *to be diluted to specific gravity* 1·240 ; *how many grammes of water are required ?*

x = grammes of water required.
G = 4,000 (weight of liquid to be diluted).
a = 35 (difference [in grammes] of specific gravity).
S = 1·275 (specific gravity of liquid to be diluted).
g = 240 (difference in weight [in grammes] of the required specific gravity and that of 1 litre of water).

$$\frac{4000 \times 35}{1{\cdot}275 \times 240} = 457 \text{ grammes of water required for dilution.}$$

Table showing the proportions of rectified spirit (90 per cent. alcohol by volume) *to be diluted with distilled*

* $\frac{1}{1{\cdot}7535} = 0{\cdot}57028.$

water to 1 *litre at* 15·5° to produce the diluted alcohols of the Pharmacopœia :

Alcohol required.	Mils. of 90 per cent. alcohol.	Specific Gravity.
70 per cent.	777·8	0·8899
60 ,,	666·7	0·9134
45 ,,	500·0	0·9435
20 ,,	222·2	0·9760

NOTE.—Alcohol mixes with water in all proportions, heat being evolved and contraction taking place. The contraction is greatest when the proportions approximate to the formula $C_2H_5OH + 3H_2O$; *i.e.*, 52·3 volumes of ethylic alcohol and 47·7 volumes of water. If such a mixture is made at 15·5°, it will be found, when the same temperature is regained, that the mixture only measures 96·35 volumes instead of 100, indicating a contraction of 3·65 per cent. by volume.

Table of Official Alcohols of the more Important Countries.

Pharmacopœia	Specific Gravity.	Official Name.	Percentage of Absolute Alcohol by Volume.
British	0·8337	Alcohol 90% (Spiritus Rectificatus).	90
	0·8899	Alcohol 70%	70
	0·9134	,, 60%	60
	0·9435	,, 45%	45
	0·976	,, 20%	20
Austrian	0·830 –0·834	Sp. Vini Concentratus	90 –91·2
	0·892 –0·896	,, Dilutus	68 –69
	0·935 –0·945	,, Cognac	44 –48
Belgian	0·816 –0·820	,, Spiritus	94·09
Danish	0·812 –0·816	Spiritus Alcoholisatus	95 –96
	0·831 –0·834	,, Concentratus	90 –91
	0·890 –0·895	,, Dilutus	68 –70
Dutch	0·8159	,, Fortior	95
	0·8897	,, Dilutus	70
French	0·79433–0·79683	Alcool Ethylique	100
	0·816	,, ,, at 95°	95
German	0·796 –0·797	Alcohol Absolutus	99·46–99·66
	0·830 –0·834	Spiritus	90·09–91·29
	0·892 –0·896	,, Dilutus	68 –69
		,, e Vino (by weight)	at least 38
Hungarian	0·834 –0·835	,, Concentratus	90·1 –89·8
	0·8125 –0·8200	,, Concentratissimus	96 –94·1
	0·890 –0·891	,, Dilutus	70·2 –69·8
Italian	0·800	Alcool Absoluto	99
	0·8169	,, 95°	95
	0·8344	,, 90°	90
	0·8644	,, 80°	80
	0·8905	,, 70°	70
	0·9139	,, 60°	60

Table of Official Alcohols of the more Important Countries—continued.

Pharmacopœia.	Specific Gravity.	Official Name.	Percentage of Absolute Alcohol by Volume.
Japanese	0·830 –0·834	Spiritus	90 –91·2
	0·892 –0·896	,, Dilutus	68 –69
	0·79	Alcohol Vinico	100
Mexican		,, at 50°	50
		,, at 60°	60
		,, at 80°	80
		,, at 90°	90
Norwegian	0·8125 –0·8165	Spiritus Concentratus	96 –95
	0·9020 –0·9045	,, Dilutus	65·19–64·12
Portuguese	0·834	Alcool at 90°	90
	0·850	,, at 85°	85
	0·905	,, at 65°	65
Russian	0·813 –0·816	Sp. Vini (95%)	95
	0·831 –0·834	,, (90%)	90
	0·888 –0·890	,, (70%)	70
	0·952 –0·955	,, (38%)	38
Spanish	0·794	Alcohol Anhidro	100
	0·8161	,, de 95°	95
		,, de 60°	60
Swedish	0·831 –0·833	Spiritus Concentratus	90 –91
	0·889 –0·891	,, Dilutus	69·6 –70·5
	0·934 –0·938	,, Tenuis	48·4 –50·6
Swiss	0·830 –0·834	Spiritus	90·09–91·29
	0·892 –0·895	,, Dilutus	68·12–69·34
	0·916 –0·939	,, e Saccharo (Rum)	50 –60
	0·927 –0·950	,, e Vino (Cognac)	45 –55
U.S.A.	0·816	Alcohol	94·9
	0·797	,, Absolutum (by weight)	99
	0·936	,, Dilutum	48·9
	0·925 –0·941	Sp. Vini Gallici	46 –55
	0·924 –0·945	Sp. Frumenti	44 –55

Formula for Correction for Temperature in Specific gravity of Mixtures of Alcohol and Water

$$w = w' \pm t\left(0{\cdot}00014 \times \frac{1 - w'}{150}\right)$$

where w' = observed temperature.
w = density at 15·5°.
t = difference between the normal and observed temperatures in degrees Centigrade.
0·00014 = coefficient of expansion of alcohol.
+ is used if observed temperature is above 15·5°.
— is used if observed temperature is below 15·5°.

Rules for making Alcohol of any required lower percentage from Alcohol of any higher percentage.

I. *By volume.*

Let the volume-percentage of the stronger alcohol be V.
Let the volume-percentage of the weaker alcohol be *v*.

Rule.—Mix *v* volumes of the stronger alcohol with sufficient water to produce V volumes of product. Allow the mixture to cool to 60° F., when full contraction will have taken place, and make up any deficiency with water.

Example.—Alcohol 30 per cent. by volume is to be made from alcohol 90 per cent. by volume.—Take 30 volumes of 90 per cent. alcohol, and dilute with water to 90 volumes.

II. *By weight.*

Let the weight-percentage of the stronger alcohol be W.
Let the weight-percentage of the weaker alcohol be *w*.

Rule.—Mix *w* parts by weight of the stronger alcohol with sufficient water to produce W parts by weight of product.

Example.—Alcohol of 50 per cent. by weight is to be made from alcohol of 90 per cent. by weight.—Take 50 parts by weight of 90 per-cent. alcohol, and add enough water to produce 90 parts by weight.

Immature Spirit

Since the passing of the Immature Spirit Act (1915) alcohol supplied for medicinal purposes has been known as *immature spirit*.

This Act increased the duty on all spirit taken from bond, but allowed a rebate of 1*s*. 6*d*. for each proof gallon which was shown to have been used solely in the manufacture of medicinal preparations.

The Finance Act of 1918 imposed an additional tax of 15*s*. 3*d*. per proof gallon, the Finance Act of 1919 a further 20*s*. per proof gallon, and the Finance Act of 1920 a further 22*s*. 6*d*. per proof gallon.

Rebate on medicinal preparations was allowed under each Act, so that the total duty paid which may be

claimed as rebate is now (1924) 59*s.* 3*d.* per proof gallon. Since this is equivalent to £4 13*s.* 6*d.* for each gallon of 90 per-cent. alcohol used to the satisfaction of the Commissioners of Customs and Excise, it has not been considered out of place in this work to deal with the subject in detail.

1. All claims for rebate are made through the local Surveyor of Customs and Excise.

2. A strict account must be kept of all immature spirit received and used.

3. Claims for rebate will not be considered on quantities of less than *two* proof gallons at a time.

4. It has to be proved to the satisfaction of the local Surveyor of Customs and Excise that the full duty on which the claim is based has been paid. To meet this, the spirit vendor now makes the necessary declaration in the form of an endorsement on the Excise certificate accompanying the spirit.

5. Rebate is allowed only on *medicinal* preparations and not on those which may be classed as flavourings, perfumes, toilet preparations, etc. The difficulty sometimes arises as to the classification of certain preparations, and since the Commissioners of Customs and Excise do not see fit to publish a detailed list it only remains for the pharmacist to claim rebate in all doubtful cases.

The following list of preparations on which rebate is *not* allowed may be helpful :

Concentrated waters (excepting camphor, chloroform, and clove).

Spirits of an aromatic or cordial nature—*e.g.* anise, cinnamon, lavender, peppermint, nutmeg, rosemary.

Tinctures of an aromatic or cordial nature—*e.g.* orange, lemon, cinnamon ; also cochineal and quinine.

All toilet preparations—*e.g.* bay rum, bay rum and cantharides, dentifrices, hair lotions, mouth washes, skin lotions, etc.

Flavouring essences—*e.g.* almond, vanilla, &c.

Perfumery of all kinds.

6. Claims for rebate *may* be made each month, and *must* be made within three months of the date on which the preparation was made.

Immature spirit stock books containing the necessary columns are obtainable, but it is a simple matter for any pharmacist to prepare his own book. Below are speci-

men pages showing suggested rulings and method of book-keeping giving the information required by the Commissioners of Customs and Excise. All spirit is to be accounted for in terms of proof gallons. Rebate is only allowed to the *second* decimal place, but in keeping the accounts each item should be worked out to three or four decimal places, since the Commissioners of Customs and Excise do not allow ' approximations.'

Immature Spirit Record

Stock and Receipts

Date.	Permit No.	Received from	Of	Bulk Gallons.	Strength.	Proof Gallons.	Duty Paid.
1920 July 1		Balance of	stock	3 pints 8 oz. fl.	57·8 o.p.	0·670	74/– proof gal.
,, 8		A. B. & Co.,	London	2 gals.	57·8 o.p.	3·156	74/– proof gal.
		Stock and r	eceipts			3·826	
		Total amou	nt used			3·611	
		Theoretical	stock			0·215	
		Actual stock		1 pint 1½ oz. fl.	57·8 o.p.	0·211	

Since the conversion to ' proof gallons ' of every small amount used would be very tedious, it is necessary to construct tables of reference such as those given below. These tables are based on absolute alcohol as being 75·35° o.p.

On this basis 90 per cent. alcohol = 57·8° o.p.
70 ,, ,, = 22·7° o.p.
60 ,, ,, = 5·2° o.p.
45 ,, ,, = 21·1° u.p.
20 ,, ,, = 64·9° u.p.

Immature Spirit Record

Issues

Rebate *not* Claimed.							Rebate Claimed.						
Date.	Preparation.	Amount of Spirit Used.			Strength.	Proof Gallons.	Date.	Preparation.	Amount of Spirit Used.			Strength.	Proof Gallons.
		Mils.	Pints.	Fl. Oz.					Mils.	Pints.	Fl. Oz.		
July 3	Sp. Menth. Pip.	270	—	—	57·8 o.p.	0·093	July 3	Sp. Chlorof.	—	—	19	57·8 o.p.	0·187
,, 8	Aq. Lavand.	—	1	16	57·8 o.p.	0·355	,, 7	Tr. Camph. Co.	—	—	19	5·2 o.p.	0·124
,, 16	Ess. Vanillæ	—	—	18	57·8 o.p.	0·177	,, 14	Tr. Cantharidin.	495	—	—	57·8 o.p.	0·171
,, 19	Skin Lotion	—	—	5	57·8 o.p.	0·049	,, 22	Sp. Camphor.	—	—	9	57·8 o.p.	0·088
,, 24	Tr. Cinnam.	520	—	—	22·7 o.p.	0·140	,, 23	Tr. Nucis Vom.	—	2	—	57·8 o.p.	0·394
,, 28	Bay Rum	—	1	0	57·8 o.p.	0·197	,, 28	Tr. Iodi. Mit.	—	1	18	57·8 o.p.	0·374
							,, 29	Cough Mixture*	—	6	8	57·8 o.p.	1·262
						1·011							2·600
								Amount on which rebate claimed					2·600
								Amount on which rebate *not* claimed					1·011
								Total amount used.					3·611

* Since this is an unofficial preparation the formula will have to be submitted to the Commissioners of Customs and Excise for approval.

Proof Spirit Conversion Table

Imperial Measure

Amount used.	Proof Spirit equivalent, *in gallons*, of—				
	90 per Cent. Volume = 57·8 o.p.	70 per Cent. Volume = 22·7 o.p.	60 per Cent. Volume = 5·2 o.p.	45 per Cent. Volume = 21·1 u.p.	20 per Cent. Volume = 64·9 u.p.
Fluid ounces					
1	0·0098	0·0076	0·0065	0·0049	0·0021
2	0·0197	0·0153	0·0131	0·0098	0·0043
3	0·0295	0·0230	0·0197	0·0147	0·0065
4	0·0394	0·0306	0·0262	0·0197	0·0087
5	0·0493	0·0383	0·0328	0·0246	0·0109
6	0·0591	0·0460	0·0394	0·0295	0·0131
7	0·0690	0·0536	0·0460	0·0345	0·0153
8	0·0789	0·0613	0·0526	0·0394	0·0175
9	0·0887	0·0690	0·0591	0·0443	0·0197
10	0·0986	0·0767	0·0657	0·0493	0·0219
11	0·1084	0·0843	0·0723	0·0542	0·0240
12	0·1183	0·0920	0·0789	0·0591	0·0262
13	0·1282	0·0997	0·0854	0·0641	0·0284
14	0·1380	0·1073	0·0920	0·0690	0·0306
15	0·1479	0·1150	0·0985	0·0739	0·0328
16	0·1578	0·1227	0·1052	0·0789	0·0350
17	0·1676	0·1303	0·1117	0·0838	0·0372
18	0·1775	0·1380	0·1183	0·0887	0·0394
19	0·1873	0·1457	0·1249	0·0936	0·0416
Pints					
1	0·1972	0·1534	0·1315	0·0986	0·0438
2	0·3945	0·3038	0·2630	0·1972	0·0976
3	0·5917	0·4602	0·3945	0·2958	0·1315
4	0·7890	0·6137	0·5260	0·3945	0·1953
5	0·9862	0·7671	0·6575	0·4931	0·2191
6	1·1835	0·9205	0·7890	0·5917	0·2630
7	1·3807	1·0740	0·9205	0·6903	0·3068
Gallons					
1	1·5781	1·2274	1·0521	0·7890	0·3507

Proof Spirit Conversion Table

Metric Measure

Amount used.	Proof Spirit equivalent, *in gallons*, of—				
	90 per Cent. Volume = 57·8 o.p	70 per Cent. Volume = 22·7 o.p.	60 per Cent. Volume = 5·2 o.p.	45 per Cent. Volume = 21·1 u.p.	20 per Cent. Volume = 64·9 u.p.
Millilitres (Mils)					
5	0·0017	0·0013	0·0011	0·0008	0·0003
10	0·0034	0·0027	0·0023	0·0017	0·0007
20	0·0069	0·0054	0·0026	0·0034	0·0015
25	0·0086	0·0067	0·0057	0·0043	0·0019
30	0·0104	0·0081	0·0069	0·0052	0·0023
40	0·0138	0·0108	0·0092	0·0069	0·0030
50	0·0173	0·0135	0·0115	0·0086	0·0038
60	0·0208	0·0162	0·0138	0·0104	0·0046
70	0·0243	0·0189	0·0162	0·0121	0·0054
80	0·0277	0·0216	0·0185	0·0138	0·0061
90	0·0312	0·0243	0·0208	0·0156	0·0069
100	0·0347	0·0270	0·0231	0·0173	0·0077
200	0·0694	0·0540	0·0462	0·0347	0·0154
250	0·0867	0·0675	0·0578	0·0434	0·0192
300	0·1041	0·0810	0·0694	0·0520	0·0231
400	0·1388	0·1080	0·0925	0·0694	0·0308
500	0·1735	0·1350	0·1157	0·0867	0·0385
600	0·2082	0·1620	0·1388	0·1041	0·0462
700	0·2430	0·1890	0·1620	0·1214	0·0540
800	0·2777	0·2160	0·1851	0·1388	0·0616
900	0·3124	0·2430	0·2082	0·1561	0·0694
Litres					
1	0·3471	0·2700	0·2314	0·1735	0·0771

Methylated Spirit

Under certain conditions two kinds of methylated spirit are permitted to be received by licensed persons; these are *mineralised* spirit and *industrial* spirit.

Mineralised spirit must contain $\frac{3}{8}$ of 1 per cent. (0·375 per cent.) of mineral naphtha * of a specific gravity of not less than 0·800. This is the only spirit allowed to be sold by retailers. This spirit may be used

* See footnote on next page.

for the preparation of the pharmacopœial liniments (Linimentum Saponis, Linimentum Camphoræ Ammoniatum, Linimentum Aconiti, and Linimentum Belladonnæ) provided they are plainly labelled ' Methylated.'

The Board of Customs and Excise have stated that they will not interfere with the use of mineralised methylated spirit by registered chemists and druggists in the preparation of lotions for external use prescribed by medical practitioners, and further that a licence to retail methylated spirit will not be required in respect of the use of mineralised methylated spirit in dispensing prescriptions under the National Insurance Act. It must, however, be clearly understood that a penalty will be incurred by any chemist and druggist who uses methylated spirit in any preparation capable of being employed as a beverage or internally as a medicine.

Industrial spirit contains 5 per cent. of wood naphtha, and no mineral naphtha. It may not be sold by retailers. Sanction for the use of this in the arts and manufactures must be obtained from the Board of Customs and Excise, and security has to be given for its proper use. It must only be used for purposes which are definitely specified, and if at any time it is required for another fresh, although similar, purpose, permission must first be obtained from the Board. Some of the purposes for which permission is granted are the preparation of vegetable extracts, medicated cottons and gauzes, &c., *provided the whole of the spirit is completely removed from the finished product.* The spirit may be recovered by distillation, but care must be taken that the recovered spirit does not become too pure by repeated distillation.

* Composition of Mineralised Methylated Spirit (May 1, 1924):—

Mineral naphtha	0·375 per cent.
Crude pyridine	0·500 „ „
Wood naphtha	9·500 „ „
Spirit to produce 100 volumes.	

In addition there is added at least 10 grains of methyl violet to each 100 gallons.

ALCOHOL TABLES AND RULES

Percentage of Ethylic Alcohol by Weight corresponding to the Specific Gravity taken at 15·5° C. (60° F.). Water = 1

Percentage by Weight	Specific Gravity	Percentage by Weight	Specific Gravity	Percentage by Weight	Specific Gravity	Percentage by Weight	Specific Gravity
1	0·9981	26	0·9637	51	0·9160	76	0·8581
2	0·9963	27	0·9622	52	0·9138	77	0·8557
3	0·9944	28	0·9607	53	0·9116	78	0·8533
4	0·9928	29	0·9592	54	0·9090	79	0·8509
5	0·9912	30	0·9577	55	0·9072	80	0·8484
6	0·9896	31	0·9560	56	0·9049	81	0·8459
7	0·9880	32	0·9544	57	0·9027	82	0·8435
8	0·9866	33	0·9526	58	0·9004	83	0·8409
9	0·9852	34	0·9508	59	0·8981	84	0·8385
10	0·9839	35	0·9490	60	0·8958	85	0·8359
11	0·9826	36	0·9472	61	0·8935	86	0·8333
12	0·9813	37	0·9453	62	0·8911	87	0·8307
13	0·9800	38	0·9433	63	0 8888	88	0·8282
14	0·9788	39	0·9413	64	0·8865	89	0·8256
15	0·9775	40	0·9394	65	0·8842	90	0·8229
16	0·9763	41	0·9374	66	0·8818	91	0·8203
17	0·9751	42	0·9353	67	0·8795	92	0·8176
18	0·9739	43	0·9332	68	0·8772	93	0·8149
19	0·9727	44	0 9311	69	0·8748	94	0·8122
20	0·9714	45	0·9291	70	0·8724	95	0·8094
21	0·9702	46	0·9269	71	0·8700	96	0·8065
22	0·9690	47	0·9249	72	0·8676	97	0·8036
23	0·9677	48	0·9227	73	0·8652	98	0·8006
24	0·9664	49	0·9204	74	0·8629	99	0·7976
25	0·9651	50	0·9183	75	0·8605	100	0·7946

Percentage of Ethylic Alcohol by Volume corresponding to the Specific Gravity taken at 15·5° C. (60° F.). Water = 1

Percentage by Volume	Specific Gravity	Percentage by Volume	Specific Gravity	Percentage by Volume	Specific Gravity	Percentage by Volume	Specific Gravity
1	0·9985	26	0·9698	51	0·9323	76	0·8747
2	0·9970	27	0·9688	52	0·9303	77	0·8720
3	0·9956	28	0·9677	53	0·9283	78	0·8693
4	0·9942	29	0·9666	54	0·9263	79	0·8666
5	0·9928	30	0·9655	55	0·9242	80	0·8639
6	0·9915	31	0·9643	56	0·9221	81	0·8611
7	0·9902	32	0·9631	57	0·9200	82	0·8583
8	0·9890	33	0·9618	58	0·9178	83	0·8555
9	0·9878	34	0·9605	59	0·9156	84	0·8526
10	0·9866	35	0·9592	60	0·9134	85	0·8496
11	0·9854	36	0·9579	61	0·9112	86	0·8466
12	0·9843	37	0·9565	62	0·9090	87	0·8436
13	0·9832	38	0·9550	63	0·9067	88	0·8405
14	0·9821	39	0·9535	64	0·9044	89	0·8373
15	0·9811	40	0·9519	65	0·9021	90	0·8337
16	0·9800	41	0·9503	66	0·8997	91	0·8306
17	0·9790	42	0·9487	67	0·8973	92	0·8272
18	0·9780	43	0·9470	68	0·8949	93	0·8237
19	0·9770	44	0·9452	69	0·8925	94	0·8201
20	0·9760	45	0·9435	70	0·8900	95	0·8164
21	0·9750	46	0·9417	71	0·8875	96	0·8125
22	0·9740	47	0·9399	72	0·8850	97	0·8084
23	0·9729	48	0·9381	73	0·8825	98	0·8047
24	0·9719	49	0·9362	74	0·8799	99	0·7995
25	0·9709	50	0·9343	75	0·8773	100	0·7946

Formula for Diluting Alcohol or any other Liquid of any Specific Gravity to any lower Specific Gravity.

$$x = \frac{G \times a}{S \times g}$$

where x = quantity of water to be added, in grammes.
G = weight of liquid to be diluted, in grammes.
a = difference (in grammes) between known and required specific gravities.
S = specific gravity of liquid to be diluted.
g = difference in weight (in grammes) of the required gravity and that of 1 litre of water.

Example.—Given 4,000 grammes of a liquid of specific gravity 1·275 to be diluted to specific gravity 1·240 ; how many grammes of water are required ?

x = grammes of water required.
G = 4,000 (weight of liquid to be diluted).
a = 35 (difference [in grammes] of specific gravity).
S = 1·275 (specific gravity of liquid to be diluted)
g = 240 (difference in weight [in grammes] of the required specific gravity and that of 1 litre of water.)

$\frac{4000 \times 35}{1{\cdot}275 \times 240}$ = 457 grammes of water required for dilution.

Formulas for Increasing or Decreasing the Strength of Percentage Liquids

I. Given a liquid of known weight and percentage : required to know the quantity of a liquid of the same kind, of higher or lower percentage or of water, which will have to be added to produce a desired percentage.

Let a be the quantity of the given liquid ;
b its percentage of important constituents ;
c the percentage of the liquid to be mixed with a ;
d the desired percentage of the mixture ;
x the quantity of the liquid, of higher or lower percentage, or the quantity of water, to be added to a.

1. Then $x = \frac{a(b - d)}{d - c}$ *if the liquid to be added is of higher or lower percentage ;* or in words : to find x (the quantity of liquid to be added), multiply the difference between the percentage of the liquid a and the desired percentage of the mixture d by the quantity of the liquid a, and divide the product by the difference between the desired percentage and that of the liquid to be mixed with a.

Example.—Supposing we have 40 parts of a liquid of 50 per cent., and want to mix it with a liquid of 20 per cent. in order to get one of 30 per cent., how much of the liquid of 20 per cent. should be added ?

x (the quantity of the liquid of 20 per cent.)

$$= \frac{40\ (50 - 30)}{30 - 20} = \frac{40 \times 20}{10} = 80$$

2. *If water is to be added,* $x = \frac{a\,(b - d)}{d}$; or in words:

to find x (the quantity of water to be added), proceed as described under (1), but divide the product by the desired percentage only.

Example.—Supposing we have 40 parts of a liquid of 50 per cent., and want to mix it with water to get one of 30 per cent., how much water must be added?

$$x \text{ (the quantity of water)} = \frac{40\,(50 - 30)}{30} = \frac{40 \times 20}{30}$$

$$= \frac{800}{30} = 26\tfrac{2}{3}.$$

II. Given two liquids of the same kind, one of higher and the other of lower percentage; or one of any percentage, the other being water; required to know the quantity of the weaker liquid to be added to the stronger to produce a desired weight and percentage.

Let a be the desired weight or quantity of the mixed liquids;
b the percentage of the stronger liquid;
c the percentage of the weaker liquid;
d the percentage of the mixture;
x the weight of the weaker liquid or of water to be added to the stronger.

1. $x = \frac{a\,(b - d)}{b - c}$, *if a stronger liquid is to be mixed with a weaker one;* or in words: to find x (the quantity of the weaker liquid), multiply the difference between the percentage of the stronger liquid and the desired percentage of the mixture by the desired weight or quantity of the mixed liquids, and divide the product by the difference between the percentage of the stronger and that of the weaker liquid.

Example.—Supposing we have a liquid of 60 per cent., and another of 20 per cent., and require 40 parts of a liquid of 30 per cent., how much of the 20 per cent. liquid must be taken?

x (the quantity of the weaker liquid)

$$= \frac{40\,(60 - 30)}{60 - 20} = \frac{40 \times 30}{40} = 30.$$

Then the quantity of the stronger liquid will be 10 parts to produce the required 40 parts.

2. $x = \frac{a\,(b - d)}{b}$, *if a stronger liquid is to be mixed with water;* or in words: to find x (the quantity of water

to be added) proceed as described under II. (1), but divide the product by the percentage of the stronger liquid only.

Example.—Supposing we have a liquid of 60 per cent., and want 40 parts of a liquid of 30 per cent., how many parts of water must be taken ?

$$x \text{ (the quantity of water)} = \frac{40\ (60 - 30)}{60} = \frac{40 \times 30}{60} = 20.$$

That is, 20 parts of water must be mixed with 20 parts of the given liquid.

TABLE OF SPECIFIC GRAVITIES OF THE MORE COMMON ELEMENTS. Water at 0° C. = 1.

Aluminium	2·6	Magnesium	1·74
Antimony	6·7	Manganese	8·0
Arsenic	5·9	Mercury	13·596
Bismuth	9·8	Nickel	8·9
Cadmium	8·6	Palladium	11·4
Calcium	1·58	Platinum	21·5
Chromium	7·3	Potassium	0·865
Cobalt	8·5	Rubidium	1·52
Copper	8·9	Silver	10·5
Diamond	3·531–3·501	Sodium	0·974
Gold	19·3	Strontium	2·54
Iridium	22·4	Thallium	11·8
Iron	7·8	Tin	7·3
Lead	11·4	Zinc	7·1
Lithium	0·594		

TABLE OF MELTING. POINTS OF THE MORE COMMON ELEMENTS.

Aluminium	658·7 C.	Magnesium	651 C.
Antimony	630 ,,	Nickel	1452 ,,
Arsenic	850 ,,	Palladium	1549 ,,
Bismuth	271 ,,	Phosphorus	44 ,,
Cadmium	320·9 ,,	Platinum	1755 ,,
Cerium	640 ,,	Potassium	62·3 ,,
Copper	1083 ,,	Rubidium	38 ,,
Gold	1063 ,,	Silver	960·5 ,,
Iodine	113·5 ,,	Sodium	97·5 ,,
Iridium	2300 ,,	Sulphur (S_1)	112·8 ,,
Iron	1520 ,,	Tin	231·9 ,,
Lead	327·4 ,,	Tungsten	3000 ,,
Lithium	186 ,,	Zinc	419·4 ,,

ATOMIC WEIGHTS OF ELEMENTS (1920)

Aluminium	Al	27·12	Molybdenum	Mo	96·0
Antimony	Sb	120·2	Neodymium	Nd	144·3
Argon	Ar	39·9	Neon	Ne	20·2
Arsenic	As	74·96	Nickel	Ni	58·68
Barium	Ba	137·37	Niton	Nt	222·4
Bismuth	Bi	208·0	Nitrogen	N	14·008
Boron	B	10·9	Osmium	Os	190·9
Bromine	Br	79·92	Oxygen	O	16·0
Cadmium	Cd	112·40	Palladium	Pd	106·7
Cæsium	Cs	132·81	Phosphorus	P	31·04
Calcium	Ca	40·07	Platinum	Pt	195·2
Carbon	C	12·005	Potassium	K	39·10
Cerium	Ce	140·25	Praseodymium	Pr	140·9
Chlorine	Cl	35·46	Radium	Ra	226·0
Chromium	Cr	52·0	Rhodium	Rh	102·9
Cobalt	Co	58·97	Rubidium	Rb	85·45
Columbium	Cb	93·1	Ruthenium	Ru	101·7
Copper	Cu	63·57	Samarium	Sm	150·4
Dysprosium	Dy	162·5	Scandium	Sc	45·1
Erbium	Er	167·7	Selenium	Se	79·2
Europium	Eu	152·0	Silicon	Si	28·3
Fluorine	F	19·0	Silver	Ag	107·88
Gadolinium	Gd	157·3	Sodium	Na	23·0
Gallium	Ga	70·1	Strontium	Sr	87·63
Germanium	Ge	72·5	Sulphur	S	32·06
Glucinum	Gl	9·1	Tantalum	Ta	181·5
Gold	Au	197·2	Tellurium	Te	127·5
Helium	He	4·00	Terbium	Tb	159·2
Hydrogen	H	1·008	Thallium	Tl	204·0
Indium	In	114·8	Thorium	Th	232·15
Iodine	I	126·92	Thulium	Tu	168·5
Iridium	Ir	193·1	Tin	Sn	118·7
Iron	Fe	55·84	Titanium	Ti	48·1
Krypton	Kr	82·92	Tungsten	W	184·0
Lanthanum	La	139·0	Uranium	U	238·2
Lead	Pb	207·20	Vanadium	V	51·0
Lithium	Li	6·94	Xenon	Xe	130·2
Lutecium	Lu	175·0	Ytterbium	Yb	173·5
Magnesium	Mg	24·32	Yttrium	Yt	89·33
Manganese	Mn	54·93	Zinc	Zn	65·37
Mercury	Hg	200·6	Zirconium	Zr	90·6

SOLUBILITY TABLES

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Acetanilide	1 in 190	1 in 18	1 in 4 S.V.R.; 1 in 40 Glyc.
Acid, Agaric	Sparingly	Freely	1 in 130 S.V.R.
Arsenious	1 in 100	1 in 20	1 in 8 Glyc.
Benzoic	1 in 420	1 in 12	1 in 32 Glyc.; 1 in 3 S.V.R. or Ether; sol. in fats and oils
Boric	1 in 25	1 in 3	1 in 4 Glyc.; 1 in 30 S.V.R.
Cacodylic	2 in 1	—	1 in 4 S.V.R.
Camphoric	1 in 160	1 in 10	1 in 1½ S.V.R.; 1 in 2 Ether
Carbolic	1 in 13	—	3 in 1 Glyc.; 3 in 1 Chlorof.; 6 in 1 S.V.R.; freely in fats and oils; about 5 per cent. in Soft Paraffin
Chromic	1 in 0·5	—	—
Chrysophanic	Insoluble	Insoluble	Sparingly in S.V.R.; soluble in Ether
Cinnamic	Sparingly	Sparingly	Freely in S.V.R.
Citric	1 in 0·6	—	I in 2 Glyc.; 1 in 8 Ether
Gallic	1 in 105	1 in 3	1 in 6 Glyc.; 1 in 8 S.V.R.
Hippuric	Sparingly	Soluble	Moderately sol. in S.V.R.
Monochloracetic	Freely	Very freely	Freely in S.V.R. or Ether
Osmic	1 in 18	—	—
Oxalic	1 in 10	1 in 3	—
Picric	1 in 90	—	1 in 10 S.V.R.
Pyrogallic	Freely	—	—
Rosolic	Nearly insol.	—	Moderately sol. in Ether
Salicylic	1 in 550	1 in 9	1 in 195 Glyc.; 1 in 4 S.V.R.; 1 in 2 Ether; 1 in 120 Olive Oil
Succinic	1 in 20	1 in 3	1 in 10 S.V.R.; 1 in 80 Ether
Sulphanilic	1 in 115	—	Insoluble in S.V.R. or Ether
Tannic	All proportions	All proportions	In all proportions in S.V.R. or in Glyc. after warming
Tartaric	1 in 1	—	1 in 5 Glyc.; 1 in 40 Ether; 1 in 3 S.V.R.
Trichloracetic	Freely	—	Freely in S.V.R. or Ether
Uric	Insoluble	Nearly insol.	Insol. in cold S.V.R. or Ether
Aconitine	Nearly insol.	—	1 in 35 S.V.R.; 1 in 45 Ether; 1 in 1 Chlorof.
Actol	1 in 15	—	—
Agathin	Insoluble	—	—
Agurin	Freely	—	Freely in S.V.R.
Aloin	1 in 120	Freely	1 in 20 S.V.R.
Alum (Ammonia)	1 in 11	3 in 1	1 in 1½ Glyc.
(Chrome)	1 in 5	1 in 2	—
(Potash)	1 in 11	3 in 1	1 in 3 Glyc.
Aluminium Aceto-Tartrate	1 in 1	—	—
Chloride	2 in 1	—	—
Sulphate	1 in 1½	—	—
Alumnol	Freely	—	—
Ammonium Acetate	,,	—	Freely in S.V.R.
Benzoate	1 in 5	Very freely	—
Bromide	1 in 1½	—	1 in 15 S.V.R.
Carbonate, B.P.	1 in 4	—	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Ammonium Chloride	1 in 3	—	1 in 55 S.V.R.
Citrate	Freely	—	—
Hypophosphite	5 in 6	—	—
Iodide	Freely	—	—
Molybdate	Moderately	—	—
Nitrate	1 in 1	—	—
Oxalate	1 in 24	Freely	—
Phosphate	1 in 3	1 in 1	—
Picrate	1 in 93	—	—
Salicylate	Freely	—	—
Sulphate	1 in 2	1 in 1	—
Valerianate	Freely	—	Freely in S.V.R.
Ammonol	1 in 110	—	—
Salicylate	1 in 55	—	—
Amyl Nitrite	Insoluble	—	Freely in S.V.R.
Amylene Hydrate	1 in 8	—	—
Amyloform	Insoluble	—	—
Analgen	,,	—	—
Anethol	—	—	1 in 3 S.V.R.
Antifebrin, *see* Acetanilide			
Antimony, Tartarated	1 in 17	1 in 2	—
Antipyrin, *see* Phenazone			
Antithermin	Sparingly	Freely	—
Apiol	Insoluble	—	Freely in S.V.R.
Apocodeine Hydrochloride	Freely	—	Freely in S.V.R.
Apomorphine Hydrochloride	1 in 60	—	1 in 50 S.V.R.; 1 in 100 Glyc.
Arbutin	1 in 8	Freely	1 in 40 S.V.R.
Arecolin Hydrobromide	Freely	,,	Freely in S.V.R.
Argonin	Sparingly	Freely	—
Argyrol	Freely	—	—
Aristol	Insoluble	—	Insol. in S.V.R.; sol. in Ether, fats, and oils
Asparagin	1 in 50	—	—
Aspirine	1 in 40	—	—
Atropine	1 in 500	—	1 in 3 S.V.R.; 1 in 25 Ether; 1 in 52 Glyc.; 1 in 15 Oleic Acid
Methyl Bromide	1 in 1	—	1 in 10 S.V.R.
Sulphate	2 in 1	—	1 in 4 S.V.R.
Barium Chlorate	1 in 4	1 in 1½	—
Chloride	1 in 2½	1 in 1½	—
Nitrate	1 in 13	1 in 3	—
Benzonaphthol	Sparingly	—	Freely in S.V.R.; sparingly in Ether
Berberin Hydrobromide	,,	—	Sparingly in S.V.R.
Hydrochloride	,,	—	,, ,,
Nitrate	,,	Freely	—
Phosphate	Freely	,,	Sparingly in S.V.R.
Sulphate	Sparingly	—	,, ,,
Bismuth Ammonium Citrate	1 in 1	—	—
Benzoate	Insoluble	—	—
Carbonate	,,	—	—
Salicylate	,,	—	—
Subgallate	,,	—	—
Subnitrate	,,	—	—
Borax	1 in 25	2 in 1	1 in 1 Glyc.
Bromalin	Freely	—	—
Bromine	1 in 30	—	Freely in S.V.R. or Ether
Bromipin	Insoluble	—	—

SOLUBILITY TABLES—*continued*

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Brucine	1 in 320	1 in 150	—
Butyl Chloral Hydrate	1 in 37	—	1 in 2 Ether; 1 in 1 S.V.R. or Glyc.; 1 in 20 Olive Oil
Cadmium Acetate	Freely	Freely	Freely in S.V.R.
Bromide	,,	,,	,, ,,
Chloride	,,	,,	,, ,,
Iodide	,,	,,	,, ,,
Sulphate	,,	,,	,, ,,
Caffeine	1 in 68	1 in 1	1 in 40 S.V.R.; 1 in 7 Chlorof.
Benzoate	Moderately	—	—
Citrate	1 in 32	—	1 in 22 S.V.R.
Salicylate	1 in 1	—	—
Sodio-Benzoate	1 in 1	—	—
Sodio-Salicylate	1 in 1	—	—
Calcium Bromide	Freely	Freely	Freely in S.V.R.
Carbonate	Insoluble	—	—
Chlorate	Freely	—	Freely in S.V.R.
Chloride	,,	—	,, ,,
Glycerophosphate	1 in 22	—	Less soluble in hot water
Hydroxide	1 in 900	—	—
Hypophosphite	1 in 8	—	—
Iodate	1 in 38	—	—
Iodide	Freely	—	Moderately in S.V.R.
Lactate	1 in 10	Freely	Slightly in S.V.R. (only soluble when fresh)
Lactophosphate	1 in 30	—	—
Nitrate	Freely	Freely	Freely in S.V.R.
Oxalate	Insoluble	—	—
Phosphate	Insoluble	—	—
Salicylate	Sparingly	—	—
Sulphate	1 in 500	—	—
Camphor	1 in 700	—	Very freely in Glacial Acetic Acid, Ether, S.V.R., Chlorof., Oil of Turpentine; 1 in 4 Olive Oil; liquefies on rubbing with Chloral, Thymol, Menthol, or Phenol
Monobromated	Sparingly	—	1 in 12 S.V.R.; 1 in 1 Chlorof.
Cannabin Tannate	Insoluble	—	Sparingly in S.V.R.
Cannabinon	,,	—	,, ,,
Cantharidine	Nearly insol.	—	1 in 3,000 S.V.R.?; 1 in 84 Chlorof.; 1 in 40 Acetone
Carmine	Insoluble	—	Soluble in Ammonia and dilute alkalies
Cerium Oxalate	,,	—	—
Chinaphenin	Sparingly	—	Freely in S.V.R.
Chinosol	Freely	—	—
Chloral Hydrate	1 in 0·25	—	Very freely in S.V.R., Ether, or Glyc.; liquefies on rubbing with Camphor, Thymol, Phenol, or Menthol
Chloralamide	1 in 24	—	Freely in S.V.R.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Chloralose	1 in 190	Freely	Freely in S.V.R. and Ether
Chloretone	1 in 125	—	Freely in S.V.R.; 1 in 8 Glyc.
Chloroform	1 in 160	—	Freely in S.V.R., Ether, fats, or oils
Cinchonidine	Sparingly	—	1 in 20 S.V.R.
Hydrobromide	1 in 40	Freely	
Acid	1 in 6	,,	—
Hydrochloride	1 in 20	,,	—
Acid	Freely	—	—
Salicylate	Sparingly	—	—
Sulphate	1 in 100	—	—
Acid	Freely	—	—
Tannate	Insoluble	—	—
Tartrate	,,	—	—
Cinchonine	Sparingly	—	—
Hydrochloride	Freely	—	—
Sulphate	1 in 66	1 in 15	—
Citarin	1 in 2	—	—
Citrophen	1 in 165	—	—
Cobalt Chloride	Freely	—	—
Nitrate	Sparingly	—	—
Sulphate	1 in 24	—	—
Cocaine	1 in 300	—	1 in 10 S.V.R.; 1 in 12 Olive Oil; 1 in 4 Oleic Acid; very freely in Chlorof.
Borate	Freely	—	—
Citrate	,,	—	—
Hydrochloride	2 in 1	—	1 in 3 S.V.R.; 1 in 3 Glyc.
Nitrate	Freely	—	—
Salicylate	,,	—	Freely in Alcohol
Sulphate	,,	—	—
Codeine	1 in 85	1 in 25	1 in 2 S.V.R.; 1 in 30 Ether
Hydrobromide	Freely	—	—
Hydrochloride	1 in 26	—	—
Phosphate	1 in 4	—	—
Sulphate	1 in 34	—	—
Colchicin	Soluble	—	Soluble in S.V.R.
Salicylate	,,	—	,, ,,
Collargol	—	—	—
Conine	Sparingly	—	Freely in S.V.R. & Chlorof.
Hydrobromide	Freely	—	Freely in S.V.R.
Copper Acetate	1 in 15	—	—
Ammonio-Sulphate	1 in 2	—	—
Chloride	Freely	—	—
Nitrate	,,	—	Freely in S.V.R.
Sulphate	1 in 4	1 in 1	—
Sulphocarbolate	Moderately	—	—
Cotoin	Sparingly	—	Soluble in S.V.R. and dilute alkalies
Coumarin	1 in 400	—	Very freely in S.V.R. or Ether
Creosote (Beechwood)	1 in 110	—	In all proportions Alcohol, Ether, Chlorof., Glyc., or Glacial Acetic Acid
Cystamine	1 in 1	—	1 in 8 S.V.R.
Daturine Sulphate	Freely	—	—
Dextroform	Insoluble	—	—

SOLUBILITY TABLES—*continued*

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Digitoxin (cryst.)	Insoluble	—	Moderately in Alcohol or Chlorof.
Diiodoform	,,	—	—
Dionine	1 in 7	—	1 in 5 S.V.R.
Dithion	1 in 1	—	—
Ekaiodoform	—	—	Moderately in S.V.R., Ether, or Chlorof.
Elaterin	—	—	Sparingly in S.V.R.; 1 in 25 Chlorof.
Epicarin	Nearly insol.	—	Freely in S.V.R. or Ether
Erythrol Tetranitrate	Insoluble	—	1 in 60 absolute Alcohol
Eucaine B. Hydrochloride	1 in 40	—	1 in 12 S.V.R.
Lactate	1 in 4	—	1 in 8 S.V.R.
Eugallol	Freely	—	—
Euphthalmine	,,	—	—
Euquinine	Sparingly	—	Freely in S.V.R.
Europhen	Insoluble	—	Soluble in S.V.R., Chlorof., and oils
Exalgin	1 in 50	1 in 2	1 in 2 S.V.R.
Ferropyrine	Freely	—	—
Fuchsine, *see* Rosanilin			
Gelsemine Hydrochloride	Freely sol.	—	—
Glusidum, *see* Saccharin			
Glutol	Insoluble	—	—
Gold Chloride	Very freely	—	—
and Sodium Chloride	,,	—	—
Guaiacol Benzoate	Insoluble	—	—
Carbonate	,,	—	—
Salicylate	,,	—	—
Hæmalbumin	,,	Freely	—
Hæmatoxylin	Sparingly	,,	—
Hedonal	Insoluble	—	—
Helmitol	1 in 5	—	—
Heroin Hydrochloride	Slightly	—	—
Hetraline	1 in 9	—	—
Hexamethylenetetramine	Sparingly	—	Freely in Alcohol
Holocaine Hydrochloride	1 in 50	—	—
Homatropine Hydrobromide	1 in 4	—	Freely in S.V.R.
Hydrochloride	Freely	—	,, ,,
Salicylate	,,	—	,, ,,
Sulphate	,,	—	,, ,,
Honthin	Insoluble	—	—
Hydrastine	,,	—	Freely in S.V.R.
Hydrochloride	Freely	—	,, ,,
Hydrastinine	Insoluble	—	,, ,,
Hydrochloride	Freely	—	,, ,,
Hydroquinone	Nearly insol.	—	—
Hyoscine	Insoluble	—	Freely in S.V.R.
Hydrobromide	2 in 1	—	,, ,,
Hydrochloride	1 in 2	—	,, ,,
Sulphate	1 in 2	—	,, ,,
Hyoscyamine	Insoluble	—	,, ,,
Hydrochloride	Freely	—	—
Sulphate	,,	—	—
Ichthalbin	Insoluble	—	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Ichthargan	1 in 6	—	—
Ichthyol Ammon.	Freely	—	Freely in Alcohol, oils and fats, Soft Paraffin, &c.
Iodine	Sparingly	—	1 in 10 S.V.R.; soluble in Ether and Chlorof.
Trichloride	1 in 1	—	—
Iodipin	Insoluble	—	Soluble in Ether, Chlorof., fats, and oils
Iodoform	,,	—	1 in 95 S.V.R.; freely in Ether
Iodoformine	,,	—	1 in 170 S.V.R.; 1 in 72 Chlorof.
Iodol	,,	—	1 in 3 S.V.R.
Iodopyrin	,,	Soluble	Soluble in S.V.R.
Iron and Ammonium Citrate	Very sol.	—	Sparingly in S.V.R.
Ammon. Sulphate (ous)	1 in 2	Freely	—
(ic)	1 in 6	,,	—
Arsenate	Insoluble	—	—
Benzoate (ic)	,,	—	—
Bromide (ous)	Freely	—	—
Chloride (ous)	,,	—	—
Citrate	,,	—	—
Glycerophosphate	Moderately	—	—
Hypophosphite (ous)	Insoluble	—	—
Iodide (ous)	Freely	—	—
Lactate (ous)	1 in 60	—	—
Oleate (ous)	Insoluble	—	Soluble in fixed oils and fats
Oxalate (ic)	Freely	—	—
(ous)	Nearly insol.	—	—
Peptonate	Slightly	Freely	—
Perchloride	Freely	,,	—
Pyrophosphate, with Citrate of Ammonia	,,	,,	—
with Citrate of Soda	,,	,,	—
and Quinine Citrate	Very sol.	—	Sparingly in S.V.R.
Stearate (ic)	Insoluble	—	Soluble in fixed oils and fats
Sulphate (ous)	1 in 2	2 in 1	—
(ic)	Freely	—	—
Itrol	1 in 4,000	—	—
Jalapin	Freely	—	Freely soluble in S.V.R.
Kairine	1 in 6	—	1 in 20 S.V.R.
Keratin	—	—	Soluble in Ammonia
Kryofin	Sparingly	—	1 in 15 S.V.R.
Lactophenin	1 in 330	—	1 in 9 S.V.R.
Largin	1 in 8	—	—
Lead Acetate	1 in 2	2 in 1	1 in 30
Bromide	Sparingly	Soluble	—
Carbolate	Insoluble	—	—
Carbonate	,,	Insoluble	—
Chloride	1 in 140	1 in 30	—
Chromate	Insoluble	—	—
Citrate	Slightly	Freely	—
Iodide	,,	1 in 180	—
Nitrate	1 in 2	Freely	—
Oxalate	Insoluble	—	—
Oxide	,,	—	—
Peroxide	,,	—	—
Phosphate	,,	—	—

SOLUBILITY TABLES—*continued*

S,V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Lead Salicylate	Insoluble	—	—
Subacetate	Freely	—	—
Sulphate	Sparingly	—	—
Sulphide	Insoluble	—	—
Tannate	,,	—	—
Thiosulphate	Sparingly	—	—
Lithium Acetate	Very freely	—	—
Benzoate	1 in 14	—	—
Bromide	Very freely	—	—
Cacodylate	,,	—	—
Carbonate	1 in 70	—	—
Chloride	Very freely	—	—
Citrate	,,	—	—
Guaiacate	Freely	—	Freely in S.V.R.
Hippurate	,,	—	—
Iodide	Very freely	—	—
Lactate	,,	—	—
Phosphate	Sparingly	—	—
Salicylate	1 in 1	—	—
Sulphate	Freely	—	—
Tartrate	,,	—	—
Losophan	Insoluble	—	Freely in Alcohol, Ether, or Chlorof.
Lycetol	Very freely	—	—
Lysidine	,,	—	—
Tartrate	,,	—	—
Magnesium Acetate	Freely	—	Freely in S.V.R.
Benzoate	1 in 20	—	,, ,,
Boro-citrate	Freely	—	—
Bromide	,,	—	—
Carbonate	Insoluble	—	—
Chloride	Freely	—	—
Citrate	,,	—	—
Hypophosphite	,,	—	—
Iodide	,,	—	—
Lactate	1 in 30	—	—
Nitrate	Freely	—	—
Oxide	Sparingly	—	—
Phosphate	,,	—	—
Salicylate	1 in 6	—	—
Sulphate	1 in 1·3	3 in 1	—
Sulphite	1 in 100	—	—
Manganese Acetate	1 in 3	Very freely	—
Borate	Very freely	—	—
Bromide	,,	—	—
Carbonate	Nearly insol.	—	—
Chloride	Freely	—	—
Citrate	,,	—	—
Hypophosphite	,,	—	—
Iodide	,,	—	—
Lactate	,,	—	—
Oxalate	Nearly insol.	—	—
Phosphate	Insoluble	—	—
Salicylate	Soluble	—	—
Sulphate	1 in 1	—	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Menthol	Sparingly	—	Freely in Alcohol, Ether, Chlorof., and oils; liquefies on rubbing with Chloral Hydrate, Phenol
Mercurol	1 in 100	—	—
Mercury Acetate (ic)	1 in 4	—	—
(ous)	1 in 330	—	—
Ammoniated	Insoluble	—	—
Benzoate (ic)	,,	—	—
Bromide (ic)	1 in 80	1 in 5	—
(ous)	Insoluble	—	—
Chloride (ic)	1 in 16	1 in 3	1 in 4 S.V.R.; 2 in 3 Glyc.
Chloride (Calomel)	Insoluble	—	—
Cyanide (ic)	1 in 13	—	—
Glycocholate (ic)	Slightly	—	—
Iodide (ic)	Very sparingly	—	1 in 130 S.V.R.; 1 in 53 Castor Oil; 1 in 223 Olive Oil; 1 in 257 Almond Oil
(ous)	Insoluble	—	—
Nitrate (ic)	Soluble	—	—
(ous)	Insoluble	—	—
Oxide (ous) or (ic)	,,	—	—
Oxycyanide	1 in 17	—	—
Phenate	Insoluble	—	—
Phosphate (ic) or (ous)	,,	—	—
Salicylate	,,	—	—
Sozoiodol	1 in 550	—	—
Succinimide	Freely	—	—
Sulphate (ic)	Sparingly	—	—
Sulphide	Insoluble	—	—
Tannate	,,	—	—
and Zinc Cyanide	Freely	—	—
Methyl Salicylate	Insoluble	—	Freely in S.V.R.
Sulphonal	1 in 320	—	—
Methylene Blue	Soluble	—	—
Migrainin	Freely	—	—
Morphine	Sparingly	—	—
Acetate	1 in 6	—	1 in 100 S.V.R.
Hydrobromide	1 in 25	—	1 in 50 S.V.R.
Hydrochloride	1 in 25	—	1 in 50 S.V.R.
Sulphate	1 in 20	—	1 in 700 S.V.R.
Tartrate	1 in 10	—	1 in 580 S.V.R.
Valerianate	Sparingly	—	—
Mydrine	Freely	—	—
Naphthalene	Sparingly	—	Sparingly in cold, more freely in hot, S.V.R.
Naphthol, α-	,,	—	Soluble in S.V.R.
β-	,,	—	1 in 18 S.V.R.
Narceine	,,	—	In hot S.V.R.
Narcotin	,,	—	,, ,,
Nargol	1 in 4	—	—
Nickel Bromide	Freely	—	—
Chloride	,,	—	—
Nitrate	,,	—	—
Phosphate	,,	—	—
Sulphate	,,	—	—
Nosophen	Insoluble	—	Insoluble in S.V.R.; soluble in Chlorof.
Orexin Hydrochloride	1 in 15	—	—

SOLUBILITY TABLES—*continued*

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Orexin Tannate	Insoluble	—	1 in 50 S.V.R.
Orthoform	1 in 9	—	—
New	1 in 450	—	1 in 6 S.V.R.; 1 in 14 Ether
Palladium Chloride	Soluble	Freely	—
Iodide	Insoluble	—	—
Nitrate	Freely	—	—
Sodium Chloride	,,	—	—
Pancreatin	Soluble	—	—
Papaverin	Insoluble	—	—
Paraldehyde	1 in 10	—	Freely in S.V.R.
Pelletierine	Insoluble	—	—
Tannate	1 in 700	—	—
Pepsin Scales	Soluble	—	—
Peptone	Freely sol.	—	,, ,,
Peronine	1 in 2	—	1 in 160 S.V.R.
Phenacetin	Insoluble	About 1 in 100	1 in 21 S.V.R.
Phenazone	1 in 1½	—	1 in 1½ S.V.R.
Salicylate	1 in 235	—	—
Phenocoll Hydrochloride	1 in 20	Very freely	Freely in S.V.R.
Phenol, *see* Acid, Carbolic			
Phenolphthalein	Nearly insol.	Nearly insol.	1 in 10 S.V.R.
Phenylenediamine Meta Hyd.	Soluble	Freely	—
Meta Sulph.	,,	,,	—
Phenylhydrazin Hyd.	Soluble	—	Soluble in S.V.R.
Phloridzin	Insoluble	—	1 in 4 S.V.R.
Phloroglucin	1 in 100	—	Soluble in S.V.R. and Ether
Phosphorus	Insoluble	Insoluble	1 in 25 Chlorof.; 1 in 1 Carbon Disulphide; about 1 in 100 fats and fixed oils; 1 in 200 Ether; 1 in 340 S.V.R.
Physostigmine	Nearly insol.	—	Freely in S.V.R.
Hydrobromide	Freely sol.	—	,, ,,
Hydrochloride	,,	—	,, ,,
Salicylate	1 in 130	—	,, ,,
Sulphate	4 in 1	—	,, ,,
Pilocarpine	Nearly insol.	—	,, ,,
Hydrobromide	Freely sol.	—	,, ,,
Hydrochloride	,,	—	,, ,,
Nitrate	,,	—	,, ,,
Salicylate	,,	—	,, ,,
Sulphate	,,	—	,, ,,
Piperazine	,,	—	,, ,,
Quinate	,,	—	,, ,,
Salicylate	,,	—	,, ,,
Piperidin Tartrate	,,	—	—
Platinic Chloride	Freely	Freely	Soluble in S.V.R.
Potassium Acetate	2 in 1	—	1 in 2 S.V.R.
Arsenate	1 in 5	Freely	—
Arsenite	Freely	,,	—
Benzoate	,,	,,	Freely in S.V.R.
Bicarbonate	2 in 7	—	—
Bichromate	1 in 10	1 in 2	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Potassium Borate	Freely	Freely	—
Bromate	1 in 16	,,	—
Bromide	1 in 2	—	1 in 200 S.V.R.
Cacodylate	Freely	—	—
Carbonate	4 in 3	—	—
Chlorate	1 in 16	1 in 2	1 in 170 S.V.R.
Chloride	1 in 3	Very freely	—
Chromate	1 in 2	,,	—
Cinnamate	Soluble	—	—
Citrate	Freely	—	Sparingly in S.V.R.
Cyanide (99 per cent.)	1 in 2	—	—
Ferricyanide	1 in 3	1 in 1½	—
Ferrocyanide	1 in 4	1 in 2	—
Fluoride	Freely	Freely	—
Glycerophosphate	Very freely	—	—
Hydrosulphide	Freely	Freely	Freely in S.V.R.
Hydroxide	2 in 1	—	,, ,,
Hypophosphite	2 in 1	—	1 in 8 S.V.R.
Iodate	1 in 13	—	1 in 3 S.V.R.
Iodide	4 in 3	—	1 in 12 S.V.R.
Nitrate	1 in 4	2 in 1	—
Nitrite	Very freely	—	—
Nitro-prusside	Freely	—	Soluble in S.V.R.
Oleate	Soluble	—	,, ,,
Oxalate	1 in 3	Very freely	—
Bi-	1 in 40	1 in 6	—
Perchlorate	Sparingly	—	—
Permanganate	1 in 17	1 in 3	—
Persulphate	Slightly sol.	—	—
Phosphate	—	—	—
Bi-	Soluble	—	—
Pyro-	Freely sol.	—	—
Salicylate	Freely	—	—
Silicate	—	Freely	
Sozoiodol	1 in 50	—	—
Stearate	Sparingly	Freely	—
Sulphate	1 in 10	—	—
Sulphide	1 in 3	—	—
Tartrate	5 in 3	—	—
Acid	1 in 200	—	—
Thiosulphate	Freely	—	—
Protargol	1 in 2	—	—
Pyoktannin, Blue	Soluble	Freely	Soluble in S.V.R.
Yellow	Sparingly	,,	,, ,,
Pyridine Citrate	Soluble	,,	,, ,,
Nitrate	,,	,,	,, ,,
Sulphate	,,	,,	,, ,,
Quassin Cryst.	Sparingly	—	—
Quinidine	Insoluble	—	—
Bisulphate	1 in 8	—	—
Quinine	Nearly insol.	—	1 in 6 S.V.R.
Arsenate	Sparingly	Freely	—
Arsenite	1 in 150	—	—
Benzoate	1 in 350	—	—
Carbonate	Sparingly	—	—
Citrate	1 in 1,200	1 in 30	1 in 45 S.V.R.
Glycerophosphate	1 in 200	—	1 in 200 S.V.R.
Hydrobromide	1 in 50	—	—
Acid	—	—	—

SOLUBILITY TABLES—*continued*

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Quinine Hydrochloride	—	—	—
Acid	4 in 3	—	1 in 5 S.V.R.; 1 in 7 Chlorof.
Hydroiodide	Sparingly	—	—
Hypophosphite	1 in 70	1 in 15	—
Lactate	1 in 3	1 in 1	Freely in S.V.R.
Oxalate	Nearly insol.	—	—
Phenate	1 in 400	—	1 in 80 S.V.R.
Phosphate	1 in 700		—
Quinate	1 in 5	—	1 in 10 S.V.R.
Salicylate	1 in 700	—	1 in 20 S.V.R.
Sulphate	—	—	—
Sulphocarbolate	Sparingly	—	Freely in S.V.R.
Tannate	,,	—	1 in 3 S.V.R.
Tartrate	,,	—	—
Valerianate	1 in 60	—	—
Resorcin	Soluble	Freely	1 in 1 S.V.R.; freely in Ether: 1 in 25 Olive Oil
Rosanilin Acetate	Freely	—	Freely in S.V.R.
Hydrochloride	Sparingly	—	—
Rubidium Bromide	Freely	Very freely	—
Chloride	,,	,,	—
Iodide	,,	,,	—
Nitrate	,,	,,	—
Sulphate	,,	,,	—
Saccharin	1 in 375	1 in 30	1 in 38 S.V.R.; freely sol. in dilute alkalies
Salacetol	Sparingly	—	1 in 15 S.V.R.
Salicin	1 in 29	Freely	1 in 80 S.V.R.
Saliginin	1 in 15	,,	Freely in S.V.R.
Salipyrine	Sparingly	—	Freely in S.V.R.
Salocoll	Freely	—	—
Salol	Sparingly	—	1 in 12 S.V.R.; 2 in 1 Ether; 1 in 12 Liquid Paraffin or fixed oils
Salophen	Sparingly	—	Freely in S.V.R.
Saloquinine	—	—	Soluble in S.V.R.
Salicylate	—	—	1 in 32 S.V.R.
Santonin	Sparingly	1 in 250	1 in 52 S.V.R.
Scopolamine, *see* Hyoscine			
Silver Chloride	Insoluble	Insoluble	Sol. in Ammonia, KCN, and 'Hypo' solution
Cyanide	,,	,,	,, ,, ,, ,,
Nitrate	2 in 1	Very freely	1 in 18 S.V.R.
Sodium Acetate	—	2 in 1	1 in 23 S.V.R.
Arsenate	1 in 4	Very freely	—
Arsenite	Freely	,,	—
Benzoate	1 in 2	,,	—
Bicarbonate	1 in 12	—	—
Bichromate	Freely	—	—
Bromate	1 in 3	—	—
Bromide	5 in 6	—	—
Cacodylate	2 in 1	—	1 in 1 S.V.R.
Carbonate	5 in 8	—	—
Chlorate	1 in 4	—	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Sodium Chloride	1 in 3	—	—
Cinnamate	1 in 11	—	—
Cyanide	Freely	—	—
Ethylate	Very freely	—	Very freely
Fluoride	1 in 23	—	—
Glycerophosphate	Very freely	—	—
Hydrosulphide	,,	—	—
Hydroxide	,,	—	Freely in S.V.R.
Hypophosphite	1 in 1	—	Soluble in S.V.R.
Iodate	1 in 15	—	—
Iodide	2 in 1	—	1 in 4 S.V.R.
Lactate	Freely	—	—
Nitrate	Very freely	—	—
Nitrite	5 in 6	—	—
Nitroprusside	Freely	—	—
Oleate	Soluble	Very freely	Soluble in S.V.R.
Oxalate	1 in 33	—	—
Permanganate	Very freely	—	—
Peroxid	Soluble	—	It is decomposed by water
Persulphate	,,	—	—
Phosphate	1 in 6	—	—
Bi-	Soluble	—	—
Pyro-	1 in 12	—	—
Salicylate	1 in 1	—	—
Sozoiodol	1 in 12	—	—
Stearate	Soluble	Very freely	—
Sulphate	1 in 3	—	—
Bi-	Very freely	—	—
Sulphide	,,	Very freely	—
Sulphite	10 in 13	—	—
Bi-	Very freely	—	—
Sulphocarbolate	1 in 6	—	—
Tartrate	1 in 2	—	—
and Potassium Tart.	1 in 1	—	—
Taurocholate	2 in 1	—	—
Thiosulphate	1 in 1	—	—
Tungstate	Freely sol.	—	—
Valerianate	,,	—	—
Vanadate, Meta	2 in 1	—	—
Ortho-	1 in 1	—	—
Sparteine	Insoluble	—	—
Hydrochloride	—	—	—
Sulphate	2 in 1	—	1 in 5 S.V.R.
Strontium Acetate	Soluble	Freely	—
Bromate	1 in 3	,,	—
Bromide	1 in 1	,,	—
Carbonate	Insoluble	—	—
Chlorate	1 in 1	—	—
Chloride	1 in 2	—	—
Cinnamate	1 in 100	—	—
Citrate	Sparingly	—	—
Iodide	1 in 1	—	—
Lactate	1 in 4	—	—
Nitrate	1 in 5	—	—
Phosphate	Insoluble	—	—
Salicylate	Soluble	—	—
Sulphate	Insoluble	—	—
Sulphide	,,	—	—
Strophanthin	Soluble	—	—

SOLUBILITY TABLES—*continued*

S.V.R. = 90 per cent. Alcohol. Glyc. = Glycerin. Chlorof. = Chloroform.

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Strychnine	Nearly insol.	—	1 in 170 S.V.R.; 1 in 250 Alcohol 70 per cent.; 1 in 400 Alcohol 60 per cent.; 1 in 800 Alcohol 45 per cent.; 1 in 4,200 Alcohol 20 per cent.
Hydrobromide	1 in 65	—	1 in 65 S.V.R.
Hydrochloride	1 in 35	—	1 in 50 S.V.R.
Nitrate	1 in 63	—	1 in 70 S.V.R.
Phosphate	—	—	—
Sulphate	1 in 48	—	1 in 110 S.V.R.
Sulphonal	1 in 450	1 in 20	1 in 80 S.V.R.
Sulphur	Insoluble	—	Sol. in Carbon Disulphide
Tannalbin	"	—	—
Tannigen	"	—	—
Tannoform	"	—	—
Tanocol	"	—	—
Terpene Hydrate	1 in 250	—	1 in 14 Alcohol 90 per cent.; 1 in 46 Alcohol 60 per cent.
Tetronal	1 in 550	—	1 in 12 Alcohol 90 per cent.
Thallin Salicylate	—	—	Sol. in Alcohol 90 per cent.
Sulphate	1 in 7	2 in 1	—
Theobromine	1 in 1,700	—	Very sparingly
Hydrochloride	—	—	—
Salicylate	Sparingly	—	—
Sodium Benzoate	1 in 2	Very freely	—
Salicylate	1 in 2	"	—
Theocin	1 in 190	—	1 in 80 S.V.R.
Thiocol	1 in 6	—	1 in 390 S.V.R.
Thioform	Insoluble	—	—
Thiol	Nearly insol.	Soluble	—
Thiophene Iodide	Insoluble	—	—
Thiosinamine	1 in 17	—	1 in 2 S.V.R.
Thymol	Very sparingly	—	3 in 1 S.V.R.; liquefies with Chloral, Phenol, or Camphor
Trichlorphenol	Insoluble	—	Soluble in S.V.R.
Trional	1 in 320	—	1 in 11 S.V.R.
Tussol	Freely	Very freely	—
Uranium Acetate	"	"	—
Nitrate	"	"	—
Sulphate	"	"	—
Urea	1 in 1	—	1 in 7 S.V.R.
Urethane	1 in 10	—	—
Uricedin	Freely	—	—
Urol	"	—	—
Urosin	1 in 2	—	—
Vanillin	Sparingly	—	Freely in S.V.R.
Veratrine	Very sparingly	—	" "
Veronal	1 in 160	—	1 in 9 S.V.R.
Zinc Acetate	1 in 3	1 in 1½	1 in 36 S.V.R.
Bromide	Freely	—	—
Carbonate	Insoluble	—	—
Chloride	2 in 1	—	—

—	In Distilled Water		In Other Menstrua
	At 15·5° C.	At 100° C.	
Zinc Cyanide	Insoluble	—	Soluble in Ammonia
Iodide	Freely	Very freely	—
Lactate	1 in 60	1 in 6	—
Nitrate	Soluble	Very freely	—
Oxalate	Sparingly	—	—
Oxide	Insoluble	—	—
Permanganate	Very freely	—	—
Phosphate	Insoluble	—	—
Salicylate	1 in 25	Freely	—
Sozoiodol	1 in 20	—	—
Sulphate	10 in 7	—	—
Sulphide	Insoluble	—	—
Sulphite	Sparingly	—	—
Sulphocarbolate	1 in 2	—	—
Valerianate	1 in 90	—	—

SOLUBILITIES OF CERTAIN SUBSTANCES IN COMMON USE, WITH RESULTING VOLUMES.

	By Weight.		Volumes.		Volumes.
Acid, Citric	100	with	60	water	= 125
Acid, Tartaric	100	,,	80	,,	= 140
Ammonium Bromide	100	,,	150	,,	= 200
Borax	100	,,	100	glycerin	= 172
Chloral Hydrate	100	,,	25	water	= 82
Iron, Ammon-Citrate	100	,,	50	,,	= 102
Magnesium Sulphate	100	,,	130	,,	= 180
Potassium Bromide	100	,,	170	,,	= 200
Potassium Carbonate	100	,,	75	,,	= 112
Potassium Citrate	100	,,	60	,,	= 100
Potassium Iodide	100	,,	75	,,	= 100
Silver Nitrate	100	,,	50	,,	= 80
Sodium Bromide	100	,,	120	,,	= 150
Sodium Carbonate	100	,,	55	,,	= 95
Sodium Sulphate	100	,,	300	,,	= 350
Sugar	100	,,	50	,,	= 112.5

TABLE OF SPECIFIC GRAVITIES OF FIXED OILS AND FATS, WITH THEIR CONGEALING POINTS

—	At 15·5° C.	Congealing Point
Almond Oil	0·915–0·920	Not below – 20°C.
Arachis Oil	0·916–0·922	—
Cacao Butter	0·945–0·976	—
Castor Oil	0·950–0·970	Turbid at 0° C. Solid at – 18° C.
Coco-nut Oil	0·925 (at 18° C.)	—
Cottonseed Oil	0·922–0·930	Begins at 12° C.
Lard	0·931–0·938	—
Linseed Oil	0·930–0·940	Below – 20° C.
Olive Oil	0·914–0·918	Begins at 10° C.
Rape Oil	0·913–0·917	—
Sesame Oil	0·920–0·924	About – 5° C.
Tallow	0·893–0·898 (at 100° C.)	—

TABLE SHOWING CHANGE OF SPECIFIC GRAVITY IN EXPRESSED OILS BY KEEPING

(At 15·5° C.)

—	Fresh	After 1 month	After 3 months	After 6 months
Arachis Oil	0·9209	0·9213	0·9233	0·9267
Cottonseed Oil	0·9225	0·9237	0·9261	0·9320
Olive Oil	0·9168	0·9187	0·9208	0·9246
Rape Oil	0·9168	0·9183	0·9188	0·9207

Table of Temperatures of Steam in degrees Fahrenheit corresponding to absolute pressure in pounds per square inch, with the approximate pressures above atmosphere

Absolute Pressure in lb. per sq. in.	Approximate Pressure in lb. per sq. in. *above* Atmosphere	Temperature in degrees F.	Absolute Pressure in lb. per sq. in.	Approximate Pressure in lb. per sq. in. *above* Atmosphere	Temperature in degrees F.
1	—	102·02	38	24	264·09
2	—	126·30	39	25	265·65
3	—	141·65	40	26	267·17
4	—	153·12	41	27	268·66
5	—	162·37	42	28	270·12
6	—	170·17	43	29	271·56
7	—	176·94	44	30	272·97
8	—	182·95	45	31	274·35
9	—	188·36	46	32	275·70
10	—	193·28	47	33	277·04
11	—	197·81	48	34	278·35
12	—	202·01	49	35	279·64
13	—	205·93	50	36	280·90
14	—	209·60	51	37	282·15
14·07	—	212·00	52	38	283·38
15	1	213·07	53	39	284·59
16	2	216·35	54	40	285·78
17	3	219·45	55	41	286·95
18	4	222·42	56	42	288·11
19	5	225·26	57	43	289·25
20	6	227·96	58	44	290·37
21	7	230·57	59	45	291·48
22	8	233·07	60	46	292·57
23	9	235·48	61	47	293·65
24	10	237·8	62	48	294·72
25	11	240·05	63	49	295·77
26	12	242·23	64	50	296·81
27	13	244·33	65	51	297·83
28	14	246·38	66	52	298·84
29	15	248·36	67	53	299·84
30	16	250·29	68	54	300·83
31	17	252·17	69	55	301·81
32	18	254·00	70	56	302·77
33	19	255·78	71	57	303·73
34	20	257·52	72	58	304·67
35	21	259·22	73	59	305·60
36	22	260·88	74	60	306·53
37	23	262·51			

AVERAGE COMPOSITION OF MILK

—	Woman	Cow	Mare	Goat	Ass
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Fat . .	3·3	4·0	1·1	4·3	5·6
Sugar . .	6·8	4·8	6·7	4·0	5·4
Proteids .	1·8	3·5	1·9	4·6	3·8
Ash . .	0·2	0·7	0·3	0·5	1·0

AVERAGE COMPOSITION OF COW'S MILK

—	Whole Milk	Separated Milk	Cream
Specific gravity . .	1·032	1·034	1·015
Total solids . . .	14·10	9·60	26·98
Sugar	4·70	5·05	3·32
Proteids . . .	3·50	3·62	2·02
Fat	5·05	0·20	21·95
Ash	0·79	0·78	0·58

AVERAGE COMPOSITION OF CONDENSED MILK

—	Unsweetened	Sweetened
	Per cent.	Per cent
Solids	32·0	75·0
Fat	10·0	9·0
Proteids	9·5	9·2
Lactose	11·0	11·5
Sucrose	absent	42·0
Ash	1·5	1·9

AVERAGE COMPOSITION OF BREAD

—	Original	In the dry substance					
	Moisture	Proteids N × 6·7	Ether Extract	Crude Fibre	Ash	Salt	Carbohydrates excluding Fibre
Vienna Bread	38·71	13·23	1·73	0·97	1·95	0·93	83·1
Home-made Bread	33·02	10·8	2·91	0·36	1·55	0·84	84·75
Rye Bread . .	33·42	11·86	1·02	0·95	2·79	1·5	84·36

AVERAGE COMPOSITION OF CEREALS

—	Weight of 100 Kernels in grammes	Moisture	Nitrogen (6·25)	Ether Extract	Crude Fibre	Ash	Carbohydrates other than Crude Fibre
Barley, *unhulled* .	—	10·85	11·0	2·25	3·85	2·5	69·55
Maize, American .	38·0	10·75	10·0	4·25	1·75	1·5	71·75
Wheat . . .	3·85	10·6	12·25	1·75	2·4	1·75	71·25
Buckwheat, American . .	3·0	12·0	10·75	2·0	10·75	1·75	62·75
Rye . . .	2·5	10·5	12·25	1·5	2·1	1·9	71·75
Oats, *unhulled* .	3·0	10·0	12·0	4·5	12·0	3·4	58·0
Rice, *unhulled* .	3·0	10·5	7·5	1·6	9·0	4·0	67·4
Rice, *hulled but not polished* . .	2·5	12·0	8·0	2·0	1·0	1·0	76·0
Rice, *hulled and polished* . .	2·2	12·4	7·5	0·4	0·4	0·5	78·8

AVERAGE COMPOSITION OF FLOURS

—	Moisture		Ash		Nitrogen (6·75)		Fibre		Ether Extract		Nitrogen Free Extractive	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wheat .	15·0	9·0	0·8	0·3	15·0	8·0	1·0	0·1	2·0	0·5	90·0	82·0
Rye . .	14·0	12·0	1·5	0·5	11·0	6·0	0·6	0·4	1·0	0·9	92·0	88·0
Barley .	15·0	10·0	2·0	1·0	12·0	8·5	0·6	0·3	2·0	0·5	92·0	87·0
Buckwheat	18·0	12·5	1·5	0·8	9·5	5·0	0·6	0·3	2·0	0·8	93·0	84·0
Rice .	15·0	10·0	0·6	0·3	10·0	7·0	0·4	0·1	0·6	0·3	90·0	85·0
Oat . .	10·0	6·0	2·4	2·0	18·0	14·0	1·4	0·7	9·5	6·5	76·0	72·0
Maize .	18·0	8·0	4·5	1·0	11·5	8·0	3·5	0·7	6·0	2·5	80·0	63·0

AVERAGE COMPOSITION OF BUTTER

	Per cent.
Fat	80–93
Curd	1–3
Water	5–15
Salt	0–7

AVERAGE COMPOSITION OF CHEESE

Water	31·50 per cent.
Fat	37·00 „
Proteids	26·25 „
Ash, Sugar, &c.	5·25 „

AVERAGE COMPOSITION OF BEER

—	Alcohol	Extract	Sugar
	Per cent.	Per cent.	Per cent.
German Lager Beer	3·93	5·79	0·88
English Ale	4·73	5·65	1·07
Bass's Pale Ale	6·25	6·98	—
Guinness's XX Stout	6·66	7·24	—

AVERAGE COMPOSITION OF WINES

—	Alcohol	Extract	Sugar
	Per cent.	Per cent.	Per cent.
French Red Wines	7·5	2·7	0·4
Spanish „	12·5	3·9	0·5
Italian „	10·0	3·3	0·5
Californian „	10·0	2·1	0·5
Port Wine, Sweet	16·2	8·2	6·0
Sherry Wine, „	15·5	5·0	3·0
Champagne, „	10·2	8·0	7·0

CARBOLIC ACID CO-EFFICIENTS OF VOLATILE OILS
(Martindale)

NOTE.—25·76 signifies that the oil in question is 25·76 as powerful as the same weight of absolute phenol under identical conditions.

Oil of Origanum	25·76
„ Thyme	14·85
„ Cinnamon (leaf)	9.66
„ Cinnamon (bark)	8·00
„ Clove	8·80
„ Rosemary	5·94
„ Rose	5·94
„ Cassia	5·35

CARBOLIC ACID CO-EFFICIENTS OF VOLATILE OILS (Martindale)—*continued.*

Oil of Wintergreen	4·64
,, Lavender	4·94
,, Lemon	3·94
,, Almond	3·76
,, Eucalypt. Glob.	3·55
,, Tar (Rectified)	2·17
,, Garlic	2·00
,, Sandal	1·67
,, Birch Tar	1·67
Thymol	25·29
Carvacrol	21·32
Geraniol	12·29
Cinnamic Aldehyde	8·02
Citronellol	8·11
Eucalyptol	3·76

TABLE OF RELATIVE DISINFECTANT VALUES (Gardner)

Mercuric Chloride	750
Formic Aldehyde	10
Lysol	10
Carbolic Acid	8
Izal	8
Creolin (Cyllin)	6
Jeyes Fluid	6
Walker's I.X.L.	3
Condy's Fluid	1
Sanitas Fluid	1

USEFUL DATA

Weight of 1 c.c. dry Hydrogen at 0° C. and 760 mm. = 0·0000896 gramme.

Weight of 1 c.c. dry Air at 0° C. and 760 mm. = 0·0012937 gramme.

One gramme of Hydrogen at 0° C. and 760 mm. measures 11·16 litres.

One gramme of Air at 0° C. and 760 mm. measures 0·773 litre.

Specific Gravity of Hydrogen, Air as unit, = 0·0693.

Specific Gravity of Air, Hydrogen as unit = 14·43.

Weight of 1 c.c. Mercury at 0° C. = 13·596 grammes.

Co-efficient of expansion for Gas $\frac{1}{273}$ = 0·003665 for 1° C.

AREAS OF PLANE FIGURES

π = 3·1416 ($\frac{22}{7}$ roughly)
b = base
h = perpendicular height
l = slant height
a, b, c = sides of triangle
s = ½ perimeter
r = radius

Area of Rectangle or Parallelogram = base multiplied by perpendicular height (bh)

Area of Triangle = ½ base × altitude $\left(\frac{bh}{2}\right)$

Area of Triangle in terms of sides = square root of product of ½ perimeter and ½ perimeter less each side in turn $\sqrt{s(s-a)(s-b)(s-c)}$

Area of Trapezoid = ½ sum of parallel sides multiplied by height

Area of Rhombus = half product of diagonals

Area of any Rectilinear figure = Divide into convenient figures and proceed as above

Area of a Circle = π multiplied by square on radius (πr^2); or multiply the circumference by half the radius; or multiply the square of the diameter by 0·7854

VOLUMES OF SOLIDS

Volume or contents of Cone = ⅓ area of base multiplied by perpendicular height $\left(\frac{\pi r^2 h}{3}\right)$

Volume or contents of Cylinder = area of base multiplied by height ($\pi r^2 h$)

Volume or contents of Sphere = Surface area × ⅓ radius $\left(\frac{4\pi r^3}{3}\right)$

Contents of Barrel = L (39B + 26H + 25BH) × 0·000031473 gal.

where L = length in inches of barrel (inside)
B = greatest diameter in inches (inside)
H = diameter in inches of head (inside)

A cylindrical Foot of Water = 48·96 lb. = 4·896 gals.
A cylindrical Inch of Water = 0·0284 lb. = 0·002832 gal.

SURFACE AREAS OF SOLIDS

Area of Cylinder = { circumference of base multiplied by height, plus area of ends ($2\pi rh + 2\pi r^2$).

Area of Cone = { half circumference of base multiplied by slant height, plus area of base ($\pi rbl + \pi r^2$).

Area of Sphere = { $\pi \times 4$ times radius squared ($4\pi r^2$).

RELATIVE SOLUBILITY OF GASES

One volume of Distilled Water at 0° C. and 760 mm. pressure will dissolve

Hydrogen	0·0193	volume
Nitrogen	0·02035	,,
Oxygen	0·04114	,,
Nitrous Oxide	1·3052	,,
Carbon Dioxide	1·7967	,,
Hydrogen Sulphide	4·3706	volumes
Sulphur Dioxide	79·789	,,
Ammonia	1148·8	,,

CALCULATION OF PROFIT ON COST AND RETURN

	On Cost.		On Return.
One half	50·0 per cent.	= 33	per cent.
,, third	33·3 ,,	= 25	,,
,, fourth	25·0 ,,	= 20	,,
,, fifth	20·0 ,,	= 16·6	,,
,, sixth	16·6 ,,	= 14·3	,,
,, seventh	14·2 ,,	= 12·5	,,
,, eighth	12·5 ,,	= 11·1	,,
,, ninth	11·1 ,,	= 10·0	,,
,, tenth	10·0 ,,	= 9·1	,,
,, eleventh	9·1 ,,	= 8·3	,,
,, twelfth	8·3 ,,	= 7·7	,,
,, thirteenth	7·7 ,,	= 7·1	,,
,, fourteenth	7·1 ,,	= 6·6	,,
,, fifteenth	6·6 ,,	= 6·2	,,
,, sixteenth	6·2 ,,	= 5·8	,,
,, seventeenth	5·8 ,,	= 5·5	,,
,, eighteenth	5·5 ,,	= 5·2	,,
,, nineteenth	5·2 ,,	= 5·0	,,
,, twentieth	5·0 ,,	= 4·7	,,

ELECTROLYSIS

Electro-Positive Metals	Zinc
	Cadmium
	Tin
	Lead
	Iron
	Nickel
	Bismuth
	Antimony
	Copper
	Silver
	Gold
	Platinum
	Graphite

Electro-Negative Metals

Cathode — plate is least attacked
Anode + plate is most attacked
Current proceeds *in* the liquid from + to —.

ELECTRICAL MEASURES

Volt = The Unit of Pressure = Electromotive Force = about 92·6 per cent. of that given by one Daniell's battery cell.

Ohm = The Unit of Resistance = the resistance offered to the passage of a current of electricity by a column of mercury 106 cm. long by 1 mm. diameter, at the temperature of melting ice.

Ampère = The Unit of Current = the current 1 volt. will drive through 1 ohm.

Coulomb = The Unit of Quantity = 1 ampère flowing for one second.

Watt = The Unit of Power = 44 ft. lb. per minute.

Board of Trade Unit (B.T.U.) = 1,000 watt-hours. Will keep a 16-candle incandescent lamp alight for about sixteen hours.

Farad = The Unit of Capacity = The capacity possessed by a conductor when a charge of 1 coulomb raises its potential 1 volt. The micro-farad is one-millionth of a farad.

Henry = The Unit of Self-Induction = The induction in a circuit which gives rise to an induced potential difference of one volt in the circuit when the inducing current changes at the rate of one ampère per second.

COMPARISON BETWEEN INCHES, MILLIMETRES AND BRITISH STANDARD WIRE GAUGE.

S.W.G..	1	2	3	4	5	6	7
Inches	·300	·276	·252	·232	·212	·192	·176
Millimetres	7·62	7·01	6·41	5·89	5·38	4·87	4·47
S.W.G.	8	9	10	11	12	13	14
Inches	·160	·144	·128	·116	·104	·092	·080
Millimetres	4·06	3·66	3·25	2·95	2·65	2·33	2·03
S.W.G.	15	16	17	18	19	20	21
Inches	·072	·064	·056	·048	·040	·036	·032
Millimetres	1·83	1·63	1·42	1·22	1·01	·914	·813
S.W.G.	22	23	24	25	26	27	28
Inches	·028	·024	·022	·020	·018	·016	·014
Millimetres	·711	·610	·560	·508	·457	·406	·356
S.W.G.	29	30	31	32	33	34	35
Inches	·013	·012	·0116	·0108	·01	·009	·0084
Millimetres	·330	·305	·279	·274	·254	·229	·213
S.W.G.	36	37	38	39	40	42	
Inches	·0076	·0068	·006	·0052	·0048	·004	
Millimetres	·193	·172	·152	·127	·122	·103	

COINS USED AS WEIGHTS

½*d.*	piece	=	85	grains (approx.).	∴	5	= 1	ounce.
1*d.*	,,	=	144	,, ,,	∴	3	= 1	,,
3*d.*	,,	=	22	,, ,,	∴	20	= 1	,,
6*d.*	,,	=	44	,, ,,	∴	10	= 1	,,
1/–	,,	=	87	,, ,,	∴	5	= 1	,,
2/–	,,	=	175	,, ,,				
2/6	,,	=	½	ounce ,,				

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